



Tannery of the Year: Saigon Tan Tec, Binh Duong Province, Vietnam

For years, tanning industry entrepreneur Thomas Schneider dreamed of building his ideal tannery from scratch. When a plot of land became available just north of Ho Chi Minh City in Vietnam, he took the chance to turn his dream into reality.

Thomas Schneider takes his time. His first ISA Tan Tec tannery in China was in a building he acquired in a part of Guangzhou that quickly became a busy industrial location, making expansion difficult. But he kept imagining what his ideal tannery would look like and what technology and workflow practices he would set up in it. A number of factors came together towards the end of the last decade and he set up a new tannery in Vietnam, establishing the business in 2008 and running it through contract tanners until his own facility, Saigon Tan Tec, was ready to start production in 2010.

The right plot of land became available in Binh Duong, just across the provincial boundary from Ho Chi Minh City in the south of Vietnam. The authorities there are working hard to take

advantage of Binh Duong's proximity to the big city and its infrastructure advantages, and are developing industrial parks such as Viet Huong Two, the one that houses the Tan Tec tannery. Good people became available at more or less the same time because a plant that a major automotive seat manufacturer ran in the area closed down just as the tannery was opening and 60 of the first complement of employees, including human resources and health and safety manager, Le Minh Nhat, came from there, bringing their knowledge of lean manufacturing principles and a degree of familiarity with leather.

Technical director, Tiago Horn, originally from Rio Grande do Sul in Brazil but an important member of the Tan Tec team for 16 years, points to walls made from two layers of bamboo and a 15-



Areas around the site are carefully maintained and include decorative ponds filled with rainwater. The site is surrounded by trees and shrubbery.

metre-high ceiling (designed to let a maximum amount of air flow through the building so that conditions are cool and comfortable enough, without the need to consume energy for widespread air conditioning) as examples of successful transitions from Mr Schneider's imagination to the working tannery. Everything has been carefully planned; Tiago Horn says the building, the layout of the machinery, the flow of material and so on were thought through first and executed later.

Now 380 people work there and the company is preparing to recruit between 80 and 100 more in the weeks following the Lunar New Year holiday to enable it to cope with increases in orders. These increases are likely to take its March production targets to between 3.5 million and 4 million square-feet of finished leather. Even in the peak season (from March to June) output in 2013 remained under 3 million square-feet per month. Increased demand for its leather means Saigon Tan Tec is also investing in new machinery, including one new soaking

drum, four new milling drums and three new staking machines (full details follow at the end of this report).

Wet blue from the US and Brazil

Saigon Tan Tec works from wet blue to finished leather, sourcing hides from the US and from Brazil. Monthly consumption has been around 40,000 per month, but this figure, too, is going up. Previously, Mr Horn explains, the company insisted on heavy Texas steers and branded heifers but now finds itself trying out new sources owing to availability issues. As a company, ISA Tan Tec has records of the grade of every container of wet blue it has brought to Asia for the last ten years. "The quality from the US used to be very high," the technical director says, "but it has definitely gone down in recent years." This reflects comments from tanners all over the world, including in the US itself, with years of drought conditions in many of the important cattle-farming states and a reduction in the time and money farmers spend washing their cattle and protecting

them from insect damage the main reasons offered. The US Hide, Skin and Leather Association has talked of an improvement in conditions in 2013 and of measures coming into place in 2014 that will, in time, improve quality. With demand increasing, Mr Horn says Saigon Tan Tec has looked for alternative sources of wet blue, but makes it clear the company is happy with the long-term relationships it has with key suppliers and will keep these going. "The best are still the best," he says. "And we value the good, honest relationships we have with them."

Key qualities suppliers must have

Flexibility and reliability are the key qualities he looks for in all suppliers. Almost all (around 98%) of Saigon Tan Tec's finished leather, with around half the total output waterproof leather, goes into shoes made by European and North American outdoor footwear brands, including various Wolverine Worldwide brands and several for Deckers Corporation, as well as Timberland, The North Face, Danner, Dr Marten's and Clarks.



From a technical point of view

(1) Overview of operations

Saigon Tan Tec Leather is a new-build tannery on a green-field site in the Binh Duong Province, near to Ho Chi Minh City, Vietnam, that commenced production four years ago. The sister tannery to ISA Tan Tec China, this tannery employs 380 people, and has produced an average of 2.9 million square-feet of leather for the footwear sector over the last three months.

However, a considerable amount of new equipment is being installed, and 80-100 extra staff are being employed to raise the production target to 3.5 or 4.0 million square-feet per month commencing March 2014.

(2) Manufacture and processing

The wet blue consumed by Saigon Tan Tec is provided by Tyson, USA, and from Brazil through agents who work closely with the company. About two weeks' stock is held on site, and wet back is performed in two elevated drums of 2.5 x 3.5m diameter, with discharge via a chute into a reception area, all encased in white tiles. Each hide is first clipped onto an overhead line conveyor, with delivery directly to the blue samming operation.

All of the water used for soaking these hides is screened to remove solids before delivery into a collection sump. This water is mechanically skimmed to remove natural grease, and the clean recovered water reused six times for wet-back before discharge to the effluent treatment plant. Blue sorting is carried out on a moving conveyor belt that is continuously hand-loaded with sides, with the sorted sides stacked onto pallets in six selections. When required, these pallets are loaded onto jacks set in front of three shaving machines so that the goods can be elevated and angled to best suit the operative for machine offer. After shaving, each side is checked for substance, followed by blue trimming.

Retannage and dyeing processes are performed in two rows of a total of 14 elevated Yuto drums, Each of these wooden drums is 2.5 x 3.5 m in diameter, and fitted with four angled



Each of the three shaving machines is operated by two operatives to minimise damage to the sides. The leathers are elevated and angled to reduce operative fatigue and improve the feed-off.



Blue sorting is performed under a series of lights on a moving belt. Leathers following splitting are stacked flesh side up, so that they can be easily turned over for the conveyor feed.



Because of the dangers of manually adding chemicals to feed-containers in the dyeing department – especially acids used for fixation – there are easily operated overhead showers fitted over each of the 14 feed-containers to drench the operative in the event of contamination.



Each drum has an option to segregate used neutralising, retannage-black dyeing, and fatliquoring baths for recycling in following loads. The remaining used floats are discharged directly to the effluent treatment plant.



deep shelves. These vessels run at 1.5 rpm for washing, neutralising and fixation, but 4.5 rpm for retanning/dyeing and fatliquoring. These are serviced by an overhead mezzanine with automatic water feed, but manual additions of all other chemicals. Traditional recipe sheets are displayed on a central display board, and all of the safety guards are fitted with clock faces so that the operatives can set the times of the next step in the process. These drums can process up to 300 sides per load, but a small-scale plant comprising 14 stainless steel drums is set adjacent this area for processing between five and 30 sides, and four more drums are being installed, each of a capacity of 80 sides.

The wastewaters from the retanning and dyeing department, when discharged from each drum, can be directed into four dedicated discharge pipes set at the back of each drum and beneath the mezzanine area. Each pipe is fitted with an hydraulic valve: one pipe is used for general discharges, but the others are used for neutralising, retanning when with black dyeing, and fatliquoring discharges respectively.

These segregated discharges are screened and stored in 40m³ sumps adjacent to the dyeing department. The recovered neutralising liquors are then used on following loads for washing before neutralising, and the retan-dye liquors recycled for retannage and black dyeing. This creates a saving of approximately 10% on materials consumed at this stage of the process, and a lowering of the load on the effluent treatment plant. The system is controlled from the mezzanine.

Drying operations are complex. Two pairs of samm-setting machines are used, and after a first-time operation the sides are held for a designated period, then re-sammed and set. This is followed by wet stretching-staking, then low-temperature vacuum drying.

After cooling the sides by hanging on poles, the sides are wet stretched and staked a second time, before hanging on a pole conveyor system that rises into the roof areas for tension-free drying. Once dried to suitable moisture content, the sides are finally staked using a conventional through-feed staking operation. Staking is also employed within finishing and in conjunction with dry milling operations.

Around 50% of the leathers are waterproof, and the substances range between 1.6 mm and 2.2 mm. Finishing of these leathers employs four roller-coating lines for applying oils and hot waxes, and water-based first coat for pigmented finishes. Three whole-hide spraying machines are used as single-cell units, and all of these machines have been fitted with drying units that use either gas or infrared drying, although the plant is changing to full infrared drying to better control moisture loss from the leather and reduce area losses. Part of the control on finish drying uses moisture sensors that touch each side on exit from the cabinets and shows the moisture content of each side on a display at out feed, and also the average for the pack. In addition there are three embossing presses, a boarding machine and an ironing machine.

(3) Solids management

- Wet blue splits are sold to China.
- Trimmings as crust and finished leather are sold for small leathergoods and recycling purposes.



The drying operations are finalised with tension-free drying using overhead conveyors set in the roof areas. There are three drying lines that are used, and the leathers are dried to staking moisture content.



Bamboo is used in the place of solid walls in parts of the building. This ensures a gentle flow of air throughout the plant, but also provides natural lighting in the immediate work areas.



One of the three spraying lines within the finishing department. A mixture of gas and infra-red drying is used, and there is careful control of the moisture loss within drying operations to avoid area losses.

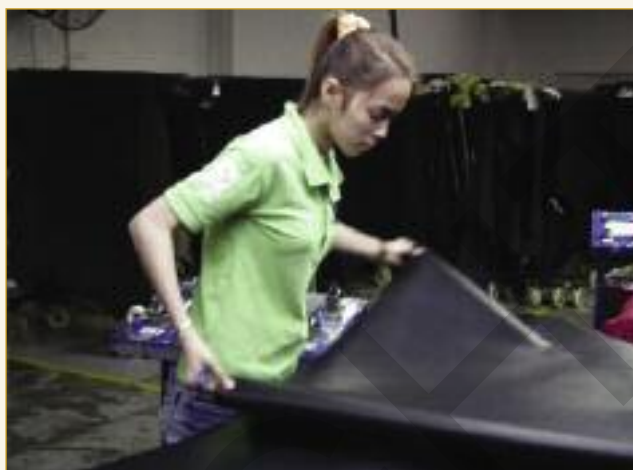


- Wet blue shavings and trimmings are removed from site by contractors for conversion into tiles and leather board.
- Sludge from effluent treatment follows filter pressing, and after an additional drying in poly tunnels is taken by an external company for conversion into bricks for combustion as fuel.
- Broken pallets, and leaves and stems harvested from a reed bed on site, are chipped for combustion within a biomass water heating system.
- All used containers are taken by contractor for washing before reuse or sales.

(4) Water and environmental management

All of the water used is provided by municipal supply. All of the water is carefully monitored and at the present the consumption stands at 52.4 litres per square-metre of leather produced. Rainwater is collected from the roof area, and this is stored in an ornamental pond at the front of the tannery. There is also a swimming pool that serves as an emergency supply of water in the event of fire. To overcome possible loss of electrical power in this event a diesel pump has been fitted behind the pool to ensure a power supply. Recycling of used floats from neutralising, black dyeings and retanning, and fatliquoring is practiced as described above.

Between 250 and 300 cubic-metres per day of effluent are generated from processing. The treatment is mainly conventional in terms of screening to remove gross solids, mixing and balancing, followed by chemical dosing and primary clarification. Secondary treatment is a comprehensive activated sludge treatment with 24-hour retention, with secondary clarification assisted by dosing with aluminium salts and polyelectrolyte. This treatment reduces the strength of the original feed from COD 4,000 mg per litre to 200 mg per litre. Effluent following secondary treatment is then dosed with polymers to remove residual colour, with part of the effluent then subjected to reed-bed treatment. Nine reed beds operating in parallel have been created around the site. Treated effluent is fed uniformly across the surface of these beds through polythene pipework, creating a vertical flow system. These reed beds receive a total of 125 cubic-metres of treated



Final inspection and grading of leathers before packaging and dispatch.



Conventional activated sludge treatment is used for secondary treatment, but settling of the biomass is assisted by dosing the effluent at the point of outflow with aluminium salts and polyelectrolyte.



Two of the reed beds used for polishing treatment. The reeds in the bed in the foreground have just been cut having reached a height of about 2.5 m. When dried and chipped these will be added to the biomass boiler.



At the present wood chippings are fed manually into each of the two biomass boilers that are now providing 35% of the energy use for this plant. The system is being modified to automatic feed.



effluent for polishing treatment over a 15-hour period. The feed rate is managed from a control unit and laboratory: the plant species set within the reed bed is vetiver, further reducing the COD by 25%-30%.

Energy use associated with cooling within the working areas has been minimised. All of the roof areas are covered with unpainted aluminium to reflect the maximum amount of sunlight and heat during the day. This is supported by 7 cm of insulation. All of the buildings are high – 15 m sloping to 7 m – and this encourages natural air movement within the factory without the use of fans.

When the building was constructed, bamboo poles were closely set in double rows in some areas in place of windows. This ensures a light breeze entering the building as these walls face the prevailing wind direction, and also provide a source of natural light. There is a large amount of natural light throughout the plant through panels set in the roof area.

Two biomass boilers have been installed to provide 35% of the total energy used within the plant as an alternative to oil. These boilers use a mix of pine and rubber tree wood and rice husk pellets as fuel, but also broken wooden pallets and dried reeds harvested from the tannery reed bed after chipping.

Natural grease recovered from the recycling of water from soaking wet blue leather is available as fuel. Hot water is generated by a battery of solar panels set on the tannery roof, and provides 12% of the power requirement for the tannery.



Solar energy is being used for provision of hot water. Three large holding tanks are used, with the cooler water drawn from the base of each tank for heating and recirculation. This provides water at 75°C, although it can be assisted if required.

Energy audits are carried out on all machines and lighting. These are closely recorded and, since operations began, the energy use per square-metre has been reduced to approximately 80% of the original consumption. ☉

"We work closely with them," Tiago Horn says. "Sometimes they come to us with requests, asking for new ideas and, for that, we often need the help of our suppliers, too, and it's here that flexibility becomes important. We need suppliers who will accept new ideas and try things out, or least be open to talking about them."

One recent example of the benefits of supplier flexibility came directly from a Saigon Tan Tec request rather than from any of the shoe brands. The company wanted its retanning drums to rotate at a slower speed when possible to save energy and consulted with European drum manufacturers, from whom Tan Tec had bought in the past, about the possibility of carrying out this change to the rotation speed. In the end, a rival company, from China, Yuto, was more responsive, Mr Horn recalls, and more willing to help find a solution. Yuto, Mr Horn says, was "delighted to help" and to adapt its technology to the tanner's needs.

Saigon Tan Tec says it is not the only operator in this part of the world to have noticed this and claims that many large producers in Asia of the American-style leathers outdoor footwear brands love have begun to look at Yuto drums. It imports wood from Africa and constructs the vessels

in China. The ones Saigon Tan Tec owns have been running practically non-stop for four years and the company is happy with the way the Yuto drums are withstanding the pressure. The Lunar New Year holiday at the end of January 2014 presented an opportunity to clean them thoroughly and relacquer them and the company is confident the drums will continue to perform well.

Strong relationships with wet blue suppliers is one of the main reasons why neither of the Tan Tec tanneries (the one in China has left Guangzhou for another part of the Pearl River Delta, Heshan) runs its own beamhouse. Purists still argue that you have to tan from raw to be able to control fully the quality of the finished leather, but more and more tanners seem to argue that if you choose the right wet blue partners and maintain a positive dialogue with them at all times, you can overcome many of the disadvantages.

Customer demand

The growth in production at Saigon Tan Tec in the early part of 2014 is real, but gauging demand among footwear brands for traditional, oily leathers such as those produced by the tannery and its immediate

competitors is usually tricky, Tiago Horn admits. It's traditionally a very demanding market for suppliers (although brands are often admirably uninhibited when it comes to setting consumer prices for their shoes). "There are a lot of players making similar types of articles," the technical director says. "There are maybe ten tanneries in Asia doing this, and we can guess their capacities. From that, we can say that our market share can still increase. It's easy for brands to change suppliers and we would like to grow our share of this market." At the moment, there seem to be various reasons for what he calls "unrest" in the global tanning industry. Some tanneries are closing down, for a variety of reasons, others are scaling down their production. "Only a few tanneries are investing in increased capacity," he says.

With this group of competing tanners making similar articles, Saigon Tan Tec's conviction is that it can win a larger share of the overall outdoor footwear market in the short term by doing after-sales well and by making sure it has its certification and audit status complete and up to date. But, even with all of this in place, customers can move on quite quickly. "All of a sudden, your price is too high," Mr



This equipment is designed to touch and measure the moisture content of each side as it exits the spray-drying cabinet. The moisture content for each side is displayed, and also the average value for the pack.



Attention to dust removal is essential, and the normal techniques are supported by hand wiping each side with tacky cloths.

Horn continues. "In theory, tanners will make money back from the audit and certification programmes they take part in thanks to increased efficiency, consuming less energy and water and so on. And, yes,

if you do it seriously, studying the numbers, measuring, improving, you see a benefit. But to do this, you have to live it; you really have to go for it. And it's possible to go through all of that only for

your customer suddenly to find a cheaper price somewhere else."

Another possibility for growth is for the entire market for leather for outdoor footwear to increase, for the cake to get bigger. "Some brands are growing," Mr Horn insists. "Others have been steady for the last two or three years and are, at least, not going down." He would like brands to take to consumers the message that defects in leather are natural and beautiful. "They don't push that," he points out. "They seem afraid of consumers sending in claims for refunds. I'm not saying consumers should accept a brand mark on the toe of a shoe, but it's time for footwear brands to tell the story of real leather."

Worker wellbeing

Employee turnover was 1.2% in 2013, which would be a commendably low rate in any business in any country in the world. But at a time of sharply rising wages in many parts of Vietnam as the country's consumer products manufacturing revolution continues, it's a source of great pride for human resources and health and safety manager, Le Minh Nhat, and for the whole company. By way of comparison, he believes most companies in the immediate environs of the tannery are likely to have experienced a turnover rate in excess of 10% in 2013.

He believes a strong focus on people rather than on output and output alone helps make a difference to Saigon Tan Tec's ability to keep its employees. Investment in automation on the tannery floor is high, which means fewer injuries and a more contented workforce, Mr Nhat says, with higher productivity as an important spin-off. The phenomenon of large numbers of workers living in on-site dormitories is far less prevalent in Vietnam than in China, so the situation at Saigon Tan Tec is that people travel by bus and scooter through heavy traffic to and from work before and after each shift. In addition, a subsidised bus shuttles back and forth between the tannery and the centre of the city. Travel and living allowances are part of the salary package.

On site, a canteen serves breakfast, lunch and dinner every working day, completely free of charge for the workers. An outside catering company is contracted to prepare and serve the food. There are monthly meetings at which the workers provide



feed back of their impressions of the quality and quantity of the meals on offer, with perhaps the biggest talking point being how spicy the food should be. "We have many regional variations in Vietnamese cooking," Mr Nhat explains, "and workers from the different regions of the country naturally sometimes find it difficult to adjust to an unusual taste. We do the best we can to please everybody." There are health-checks at least once a year for all workers, and these are more frequent for all employees who come into regular contact with chemicals. There is a full complement of qualified first-aiders on site and a contract in place with a nearby hospital for nurses to provide any necessary professional healthcare.

Children in need

Away from work, inspired by founder Tom Schneider, Saigon Tan Tec is supporting 50 Vietnamese children from low-income families in their studies, through a charity called World Vision. Drawings and cards from the children adorn the company's offices. Another project is to support Operation Smile, a charity that works to give affected children in all parts of the world free surgery to repair cleft lip, cleft palate and other facial deformities. The company's method of raising money, which helps to fly surgeons into Vietnam to carry out the operations, includes an annual charity barbecue in the tannery grounds, with entertainment provided by a band of Cuban musicians, who are usually the resident entertainers at a swish hotel in downtown Ho Chi Minh City. Guests give generously for token gifts such as little leather elephants, ornaments made by Saigon Tan Tec employees from its own trimmings.

The company's relations with the local authorities are strong, Tiago Horn says. The fact is that Binh Duong's provincial authorities have held Saigon Tan Tec up as an example of how it wants manufacturing companies to operate. Other industrial park project leaders and other companies have been brought to the site to see how things should be done. Of course, when operations began there in 2010, inspections were frequent, but Mr Horn says the powers that be now seem confident that the tanning company is doing things well and will continue to do so.

New ideas

He knows there is plenty of work still to do. For example, he is very keen to achieve further reductions in water and energy use. He is also keen to work with chemical manufacturers to establish "less environmentally hostile" ways of producing leather and says they will find a willing volunteer in Saigon Tan Tec when they have new products and new ideas to try out. The layout of the tannery is testament to the company's commitment to trying out ideas because, as mentioned above, all the planning took place first. "Even then, we know we made some mistakes," Tiago Horn says. "Some of these, we could rectify, others we couldn't because construction had already taken place, but we made sure we didn't repeat them when we built the new Tan Tec tannery in Heshan."

He also pays tribute to the enthusiasm

with which Saigon Tan Tec workers have taken change on board, saying they have thought carefully about how to make life easier, how to use less resource, trying to make a difference. There is a strong culture of ideas coming up from the factory floor. They are not all workable, but there are monetary rewards and other prizes for those that are. As is often the case, simple ideas often turn out to be among the best and one example Mr Horn points to is a case in point. "We spray water on the felt of the setting out machines," he explains, "as is standard practice. The workers on the machines worked out that they were spraying between seven and nine cubic-metres of water on the felt of each machine every day, and their idea was to collect that water and use it to wash the floor. This is the mentality we have here, and it means things happen easily in Saigon Tan Tec." 🌐

New machinery at Saigon Tan Tec

In recent months, the tannery has invested in the following new equipment:

- One soaking drum
- One Rizzi samming machine
- Four medium-sized stainless steel drums
- Three Cartigliano staking machines
- One hang dryer
- Four dry milling drums
- One embossing machine.

Control and Accreditations

LABORATORY SERVICES

In addition to chemical analysis and physical testing for each pack of leather to standards set by the company, specifications are included as demanded by individual customers. The scope of the laboratory is extended to cover wastewater treatment, and the laboratory and all eight laboratory staff are SATRA certified.

ACCREDITATION AND AWARDS

Approval and accreditation includes:

- ISO 14001
- ISO 9001
- Leather Working Group Gold award
- ECO₂L
- 2nd prize of Energy Efficiency from Dena (first tannery in Asia and first company of any kind outside Germany to receive this award)
- Timberland TQS Certificate
- Saigon Times Top 40 Energy Efficient award.