



ALSA factory at Steinau. PHOTO CREDIT: ALSA

Manufacturing in Europe

The European Union's strict environmental controls, high labour costs and increasingly restrictive employment laws have prompted many manufacturing companies in the footwear sector to shift their production to Asia. While this has been seen as a quick and easy fix, it has also led to a totally different set of problems involving lengthy supply chains, controlling quality at a distance and, of late, increasing costs due to rapidly rising labour rates in much of the Far East.

As with so many other aspects of globalisation that, ten years ago seemed so attractive to Western economies, the downsides were not immediately apparent. The global financial crisis of 2008 changed all that and, now, those same economies—especially in the Eurozone—are seeing the unwanted effects all too clearly in terms of crippling adverse trade balances, a loss of manufacturing that has hit government tax revenues and high

levels of unemployment that may yet lead to social unrest.

In some industries, manufacturing is beginning to return to Europe helped by advanced manufacturing technologies that do not require a large labour force. While we are unlikely to see the resurgence of a large footwear industry as in the past, there will be a place for companies able and prepared to embrace a similar approach. Indeed, there are companies that decided not to move production abroad and have nevertheless managed to prosper. One of these is outsole and footbed producer ALSA GmbH, located at Steinau and Görlitz in the heart of rural Germany. It has also managed to do so in the most environmentally way possible and provides a possible guide for the future.

HEAT RECOVERY

CO₂ is, as we are constantly reminded, a major factor in global warming and the production of EVA unavoidably creates it. So, how to

contain it? One way is to employ heat recovery in the moulding facilities and drying chambers. Warm used air passes through heat exchangers and the recovered heat used to pre-heat incoming air. Heat balance in the actual production area can also be better balanced by a heat recovery ventilation system. ALSA uses four air supply and exhaust systems each containing a rotating air-to-air heat exchanger working on the principle of thermal conduction so that warm air from one is mixed with cold from the other to produce warm fresh air with the minimum use of energy.

An overall reduction in energy consumption by industry in general would not only be of economic benefit, but also be significant in ecological terms. Waste heat is generated in many production processes that by intelligently linking them with new ventilation and climate technology would reduce CO₂ and other harmful emissions.

DISPLACEMENT VENTILATION

In the polyurethane production area, a different type of ventilation system is employed. This one operates on the principle of displacement flow. Fresh air is ducted into the production area at about 3°C cooler than the existing room temperature. Being cooler, it distributes itself low down and then rises as it comes into contact with the warm machines to be sucked out through the roof.

Fresh outside air is therefore available exactly where it is needed without having to circulate the total volume of air in the room. Since the exhaust air installations only work when the machines do, warm air only needs to be extracted at that time. Using this and the heat exchange system previously described, optimum employee comfort is combined with a lower consumption of energy.

REDUCING EMISSIONS

The earth's ozone layer acts as a shield against UV-B (cytotoxic ultraviolet radiation) radiated by the sun and is damaged by CFCs (chlorofluorocarbons) and other compounds with a potential for ozone depletion. ALSA was aware of the problem long before current legislation and was the first to foam up polyether systems for outsoles without using CF or CHC (halogenated chloro-fluorocarbons).

There are of course many other harmful air pollutants and the fact that air pollution in Europe has decreased over the past 20 years is the result of ever stricter legislation and a continual measurement of emissions emergence and effect. ALSA not only measures air quality production areas but also avoids raw materials that might pollute so, for example, machines used to produce PUR outsoles all have self-cleaning mixer heads so that no solvent or water is needed.

Energy-saving ECGs (electronic control gears) and LED technology have also been used to reduce CO₂ emissions. For example, two combined heat and power plants provide all the water needed to heat the machines as well as the electricity needed for light and power. A condensing natural gas boiler is used for general heating purposes while the factory buildings are designed to be as thermally efficient as possible.



Packaging is reused as many times as possible. PHOTO CREDIT: ALSA

SPACE TECHNOLOGY

The most recent innovation has come in the form of four micro-gas turbines. This pilot scheme, promoted by the Hessian Federal State Government, uses technology derived from space research to deliver energy for electricity and water at 85% efficiency in an environmentally compatible way. The turbines are fueled by liquid gas and operate at 96,000 rpm which is a similar rate to that found in the gas turbines used in aircraft. Emission values are extremely

low and, as all the principal components are located on a single airborne shaft, no lubricating or cooling agents are required so that service intervals and costs are held to a minimum.

Environmental loads are reduced when the same amount of energy is generated using less fuel input so it also costs less. This is another gain in terms of energy efficiency. Add to this the advantages to be gained from the use of low energy lighting and CO₂ emissions fall even further.



With displacement ventilation, cool rises when it contacts warm machines.

PHOTO CREDIT: ALSA

AN AGO OPTION

ALSA also offers an AGO option, supplying its PU sole units with the adhesive pre-applied and with a prolonged shelf life. (The name, from the Greek 'ago', meaning 'to lead' or 'attract', was chosen in 1910 by Italian chemist Francesco Rampichini, when developing the concept for manufacturing stitchless or glued shoes.) The adhesive is applied to a carrier film in much the same way as adhesive tapes are produced except that it remains full width rather than being slit down to smaller sizes. Shapes are cut from the film and placed into the sole moulds before they are filled with PU. Because the latter foams directly onto the adhesive, it forms a strong and permanent bond.

Furthermore, the layer of adhesive is the same all over the bonding surface of the sole.



Removing the protective film.

All the shoe manufacturer has to do is to peel off the film, activate the adhesive and attach the sole. The process is totally free of emissions and, because it also saves several operations, it also reduces costs in terms of labour and energy consumption.

REDUCING WASTE

TPM (total productive management) is a system for a continuous improvement of the production process based on zero malfunctions, defects and quality loss, etc. ALSA has found that it also helps reduce environmental impact. For instance, less idle machine time or rejected components means more efficient production and less waste of valuable energy and raw material resources.

Avoidance, recycling and environmentally friendly removal of waste also conserves resources. Packaging used when shipping to customers or for transportation within the factory is reused as many times as possible. Cardboard boxes that are then no longer of any use are sent to a workshop for disabled people that shreds and sells them on as filling material. In addition, all wastewater is purified by the company's own biological clarification plant before it returns to the public water system in the same way that all modern tanneries do.

Germany's refuse management policy operates on the principle that whoever generates waste takes responsibility for it and it has proved to be a good incentive for the country's manufacturers to only use high quality

raw materials that produce less rejects and therefore less waste. Whereas it used to be a case of simply disposing of waste, everyone now realises that it can include valuable raw materials that can be effectively reused. Avoiding waste means consuming fewer raw materials and causing less harm to the environment, so certified companies now collect and recycle all of it.

Other ways of improving overall efficiency include linking details of customer orders with the production line, using real-time diagrams that reflect the current production plan so that adjustments can be made to maximise machine utilisation. This in turn ensures that machine down time and maintenance intervals are held to a minimum, resulting in shorter production lead times and another saving in energy consumption.

ALSA has taken advantage of every possible way to increase efficiency and control costs. At the same time, it has also managed to keep within strict European legislation in regard to the environment and often to turn it to advantage, something many others have said was impossible. Well, it clearly is not and the company has proved that being environmentally friendly is not just a worthy pursuit but also makes good business sense.

As remarked at the start of this article, globalisation is no longer seen in quite the same light as it was only a few short years ago. The truth is that many in the west have come to feel that the whole concept was over-sold by politicians keen to buy votes. They have seen jobs vanish overseas with nothing left to replace them or, if they still have jobs, are seeing their standard of living being forced down through fixed or falling rates of pay and government austerity measures forced on them by previous over-borrowing. All of a sudden, the call is now for either more manufacturing in Europe or some degree of protectionism.

As has been shown in the past, the latter does not work long term. Neither will it replace industries that have all but disappeared; only investment will do that. And, for those making that investment, environmental conditions will be tougher than anywhere else in the world. Germany, alone among Eurozone countries, has managed to maintain a strong manufacturing base and has done so within those conditions. ALSA is part of that story. Could it be that environmental legislation is a help rather than a hindrance to manufacturing in Europe? 🍷