

Affordable bespoke footwear

Technologies are being developed that may in the future provide cost-effective custom-made shoes, as PHIL SHAW explains.

The term 'bespoke footwear' is generally taken to refer to shoes that are manufactured specifically for one customer. They reflect the customer's design requirements and are made to be an exact fit for their feet, offering both a high level of comfort and exclusivity.

Bespoke shoes or boots are unlike the vast majority of footwear items available through retail or internet outlets. The latter are made using mass production techniques, standardised patterns and components, and on lasts or moulds which are designed to fit the feet of the average person within the market sector.

Of course, mass production enables shoemakers to significantly reduce the unit cost of their products. By contrast, bespoke footwear will, by definition, be unable to use these economies of scale and so are therefore more expensive. Indeed, some of the high-end products made exclusively for discerning customers can represent a considerable investment.

The total footwear market in the USA for 2019 is forecast to reach 2.4 billion pairs with a revenue of almost \$86 billion – an average of \$36 per pair. However, bespoke footwear can often be priced as much as 100 times this. In order to meet a growing demand for custom-made products, footwear manufacturers are beginning to use a number of relevant technologies.

Foot scanning

An example of such technology is the use by shoemakers of foot scanning equipment which allows the shape and size of the prospective customer's feet to be rapidly and accurately recorded. This data can be used to identify and match with the most appropriate lasts from an existing bank – at least close

enough to offer an apparently customised product. If time and cost are not critical, this data can be passed to the last model maker who can then produce customised lasts which will exactly reflect the customer's feet – but with appropriate shoemaking allowances added. This is an expensive option, so if price is an issue, it is possible to use existing lasts with temporary and removable additional volumes added where necessary. These can be saved and stored as a shell to fit over a standard last, offering the customer the opportunity to have well-fitting shoes made in the future.

A wide range of activities can be included under the heading of 'bespoke'. At the most basic level, customers can select from a pre-determined, narrow range of materials

and colours – or perhaps specific design features – and add these to existing styles. A number of brand owners offer this type of service. Purchasers can often build on products that were created by well-known designers, while adding to or amending some of the details. It may be simply a case of including an embroidered or printed name or signature, or a specific motif.

Within this category, we can also consider the use of company or club logos or colours, which can be incorporated into existing footwear products to create a range of customised shoes. As with many of these items, the volume of products needed will determine the level of customisation that can be offered. A single pair of shoes will inevitably incur costs which may be shared over multiple pairs.



'Bespoke footwear' generally refers to footwear made to exactly fit a particular customer

Hard-to-find shoes

There is a long-established sector of the footwear industry which provides products for customers who have special difficulties in finding shoes that fit. This can often include those with injuries to their feet, or who have medical conditions that have affected them. Traditionally, these customers accessed bespoke footwear through medical centres or specialists such as podiatrists and chiropodists, who measured their customers' feet and provided detailed information to the lastmaker and shoemaker.

Customers who suffer from diabetes are of special concern. The potential lack of feeling in the extremities – especially toes – can lead to serious complications if the footwear exerts pressure on the foot. In extreme cases, this can result in gangrene and the need to amputate toes. The appropriate footwear must be custom-made, with the last reflecting the shape and size of each foot, and the use of soft materials will reduce or eliminate pressure.

Another issue for the sector which offers customised, or non-mass-produced footwear, is the provision of large sizes and fittings. Manufacturers will produce a range of fashionable styles to fit larger or wider feet. For example, it is possible to purchase men's footwear in sizes up to UK 16 (European 51) and women's shoes up to UK 12 (European 46), with many of these also available in a range of width fittings from 'B' (narrow) to 'H' (extra wide).

This area of the market caters for a small percentage of the population. As such, the quantities made will be unlikely to take advantage of mass production techniques. Therefore, these products will often cost more than similar products made within a more conventional size range.

Manufacturers can be found who offer to make footwear specifically for a customer – on lasts that have been created to reflect the customer's feet. These lasts will be used exclusively for each customer and stored by the shoemaker in preparation for making the required footwear. This is a time-consuming and detailed activity, which results in products that provide the wearer with high levels of comfort, and reflect his or her tastes. It is, by its very nature, expensive and therefore is



Bunion sufferers have long required custom-made footwear

generally available only to a specific sector of the market.

However, the increasing use of technology is impacting on the availability of bespoke footwear. The appropriate equipment can offer some of the features of bespoke footwear to the customer, but at a more affordable price.

Cutting costs

The use of automated cutting systems can eliminate the cost of expensive tooling, and will also allow the rapid transition from initial design into production. 'Computer-aided design' and 'computer-aided manufacturing' (CAD/CAM) is providing the opportunity for designers to rapidly create new, customised styles. Therefore, it is possible for customers to specify a particular design – requiring a number of

individual patterns – and have these pieces cut within minutes. Thus, the savings are not only in the cost of cutting dies, but also in the time required to create and tool-up any new style. This type of automation is now widespread throughout the industry.

The actual production of footwear does not require significant time – in fact, research by SATRA has established that the overall time needed for all of the making operations is between 30 and 90 minutes. Nevertheless, under traditional shoemaking conditions, footwear is made in batches, planned into an existing work programme and it can take days – in extreme cases – weeks to complete these operations. Where high volume production is planned, this may be acceptable. Some manufacturers have developed the use of small teams



Individually-designed footwear with knitted uppers is likely to become available in the future

that work on a limited number of shoes of the same style. This can reduce the throughput time to minutes, and is an ideal environment for offering a customised service. It is possible for the components to be automatically prepared, stitched and lasted into a finished shoe by this type of flexible team, and respond to customer's requests rapidly.

Some components used in shoemaking (such as sole units) are traditionally made by moulding. The moulding process works best with high volume, where it is possible to 'amortise' (gradually write off) the cost of the moulding machine and moulds over a large number of components. However, this does not fit into the bespoke/customised service which perhaps calls for a single pair of shoes and components.

Knitting and 3D printing

The gradual introduction of three-dimensional ('3D') printing has provided shoemakers with the ability to create specific components on demand, and thus to meet the needs of each customer. Perhaps this is the most recent innovation within the footwear industry that will also provide further opportunities for customisation or bespoke products. Manufacturers are increasingly producing sports and leisure footwear using knitted uppers rather

than the traditional 'cut and stitch' methods. There are many advantages claimed for this type of construction:

- lighter weight – allowing wearers to expend less energy
- flexible – knitted shoes can be made without any seams
- breathable – the elimination of adhesive helps the wicking and dispersal of foot moisture
- lacks seams – removing potential pressure points and product breakdown
- reduces cost – knitted uppers generally create less waste (unlike cut components)
- takes note of environmental issues – less waste in manufacturing and the possibility of genuinely recyclable footwear
- reduces production time – the actual manufacturing process can be much faster
- assists with the theoretical tailoring of products to individual's requirements
- implements new products and design changes faster.

Of these claimed advantages, two are particularly important. The lack of seams which removes pressure points is worth noting, as this has an advantage for bespoke footwear for diabetic wearers, who are particularly prone to foot damage from more conventionally-constructed products.

The last advantage mentioned – in which new products and design changes can be implemented faster – fits in well with the concept of offering specific product design features to individual customers. It is increasingly likely that this type of construction used to offer individually designed footwear will be seen in the future.

Help from retailers

As mentioned earlier, some companies already offer foot scanning within 'traditional' retail outlets. The customer could therefore take away electronic data representing an accurate representation of his or her own feet.

It is then conceivable that a customer could use this biometric data when accessing websites for customised or bespoke footwear. The information could be uploaded and used in conjunction with the choice of materials, style and design features to create genuinely individual shoes which could be manufactured and shipped out within a short time.

This approach brings together all the traditional elements of individual shoemaking – establishing the customer's wishes within an existing range of materials (which have been previously tested and approved as suitable for shoemaking), and construction (which has been tested for comfort, wear performance and sustainability), together with the relevant, rapid manufacturing methods (knitted uppers, 3D-printed bottom stock and small team working).

Bespoke footwear, traditionally regarded as a high-end, high-price product need not remain so. While there will continue to be this luxury sector, catering for customers for whom price is of secondary importance to the perceived quality and the perceived exclusivity, the increasing use of modern technology can offer affordable bespoke footwear to a much wider section of the population.

How can we help?

Please contact SATRA's innovation and development team for further information on the possible development of affordable, custom-made footwear.



innovation@satra.com