



Optical revolution

Norville Group is steeped in optical industry history but it is also harnessing the latest freeform technology to create a revolution in lens manufacturing for the future. **Chris Bennett** travelled to Gloucester to find out more

Walking into Norville's manufacturing base in Gloucester through the back door is like experiencing a kind of optical time tunnel. Visitors don't usually approach the business this way but a newly created access to Derby Road temporarily provides a sneaky peek behind the scenes.

On the outer fringes of the large manufacturing site are vestiges of decommissioned equipment awaiting removal or re-use. As the centre is approached the machinery becomes more modern, as flashing LEDs, flat screens and bright yellow machinery replace relays, wires and dials. At the core are high-vacuum coating machines and three freeform lines worthy of any world-class lab.

Frank G Norville OBE, chairman and latest member of this optical dynasty, is eager to explain the changes freeform have brought to Norville Group, the optical manufacturing business and the changes nearing completion in Gloucester.

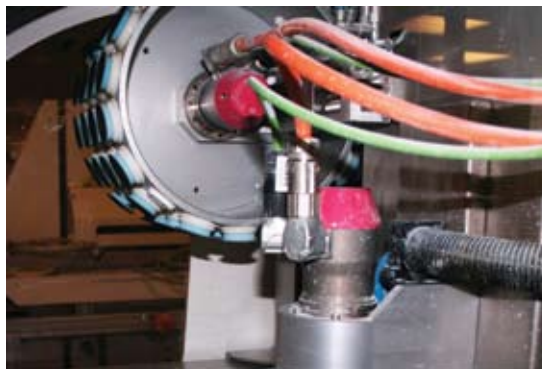
He estimates that since the millennium Norville Optical Group has closed 40,000sq ft of manufacturing space. Its history of mass frame and lens manufacture has seen huge change in its physical presence. First the frame business and then the lens manufacturing industry underwent radical change. From the outside the factory's expanse exudes the feel of a heavier industry from a different age, but inside it is being modernised and remodelled to fit in with the Norville Group's freeform future.

First for freeform

Norville Group was one of the early adopters of freeform, introducing the technology within the UK seven years ago. 'We were very lucky to be the first independent UK manufacturer to be able to do freeform,' says Norville proudly, but the learning curve has



Flashing LEDs and flat-screen computers – one of three high-tech freeform lines



Soft tool auto selection

been steep. More recently the firm held back on intermediate technology steps while the group's strategy was decided. 'A lot of people invested early on in going cut-to-polish but we didn't do that.' This needed a traditional lens polishing tool to complete the lens, in essence a process unchanged in 500 years. 'We were keen to leave all that behind which freeform polishing brings.'

Norville says getting the overall process right is the key to harnessing freeform, adding that investment of £2.4m is needed 'to offer this technology in any meaningful way.'

'Little' expensive details such as using an excimer laser or a carbon dioxide laser to etch markings, being able to accurately test and control final lens curves, 'those discs of design software' all add to complexity and cost. And the revolution goes on. Plastic blocking and plastic pre-blocking of semi-finished lenses is already on the horizon.

'We fully understand the route we want to travel for lens cutting and surfacing,' says Norville. 'We know the pieces of the jigsaw we need, we just have to sort them into order.'

That jigsaw is being assembled to deliver a new suite of high definition products Norville Group has been able to progress because of freeform technology. It sees the future in offering bespoke products for specific uses. All are tailor-made for the patient with anything up to 40,000 individual curve change points generated across the lens surface. Norville says part of his role is also to make those products understandable for his end customer, the optician, so they in turn can delight the end user.

'Freeform is hugely confusing for the optician. Essilor were right to flag



the warning that there is “freeform and freeform”. Freeform is a description of method and production, digital design is the individual key. Each company has its own brand names for their individual products,’ he says.

‘While a round bifocal used to be just that, a round bifocal, these days nothing is simple.’ But, adds Norville: ‘The optician and the practice staff have got to understand the product to be able to get that over to the customer. These are high definition, designed products and they are a sea change to what we had before.’

This upper end is where Norville sees the future. ‘The everyday progressive is not our future market because it’s too commodity, nor is it the future of independent practice.’

Alongside its general wear digital progressive lens offerings are products such as Booster, a pre-presbyopia lens designed with the Smartphone generation in mind. The Sportor lens offers an 8-base wrap, with Versatile offering the near range office or degressive lens option. Freeform also opens the door for tailored progressive designs for lifestyle such as the Freeway, a dedicated driving progressive, and the Bureau lens designed for a more expansive view in the office. All designs can be offered in a range of materials. More will surely follow.

‘These new breakthroughs have only been achieved through the change to freeform manufacturing. It’s been a revolution for us. Since we have had freeform we have seen a quickening in the pace of product development. It’s growing the business because it’s opening new doors.’

And this revolution also brings new challenges. ‘One that is immediately apparent is that we today need a different style of technician to run continuous process automated lines. It helps to still understand ophthalmic optics but there is that small yet difficult psychological step to overcome in order to cease focusing as individual jobs by way of a batch production mentality and switch to a mindset of flow production. It might sound simple but very few seemingly can make that leap.’

This is opening up some great career opportunities in manufacturing optics, concludes Norville.

Norville also points out that the lenses are made in the UK and the benefits this has on uninterrupted delivery. It is also answering the



government’s call for home-produced production.

Problem solving

Looking around the lab Norville admits: ‘We don’t look as neat as other labs because we have so much legacy equipment.’ The variety of lens types, and complex prescriptions being handled is staggering. High prescriptions and lenticulars from the high-street chains can clearly be seen alongside routine and complex jobs from Norville Group’s traditional customers.

The group is known for its technical excellence and its willingness to advise practices and problem solve, but is there a danger that they will be used just for this work?

Not at all says Norville. ‘Making difficult prescriptions is our USP and sets the firm apart and gives its customers a good reason to return. It’s exciting and interesting,’ he adds. ‘Optician readers probably wonder what could be exciting about lens making,’ says Norville. ‘Suddenly today it’s like being in a single-make car race where we are alongside those with Zeiss, Essilor and Hoya written on their doors and Norville is the independent entry right among them, tweaking our design software and utilising our 50 years of progressive supply knowledge. Do you want to be churning out those ordinary prescriptions day in day out which anyone across the world can also do? For instance, our work in being UK pioneers on processing and surfacing Trivex has been a huge advantage with freeform Trivex and we can certainly claim that we are leaders in the field’.

Glazing has become the strongest link in the optical chain because it is so accurate, says director Paul Walden. ‘Thirty per cent of the frames we are



Traditional processes: lap tool polishing and finishing (top images) and lens blocking (left)

placing in production might have been turned away two years ago thanks to the introduction of new 5-axis cutting technology. Designers used to make frames that couldn’t be glazed; now they have the challenge of catching up with us.’

Digital inner surface lenses can be manufactured to higher power tolerances than prescriptions are currently specified. Pointing to the next generation of prescription equipment, Norville says: ‘If wave front technology becomes a larger part of the tools used within the modern practice environment this will put us all in a position of using this new technology to its maximum both in dispensing and manufacturing terms.’

Walden is keen to point out that all of this technology brings benefits to the whole industry. ‘The lens manufacturing business is more of a level playing field than it has been for 30 years,’ he says.

What it doesn’t replace is the human face, the colossal range of products and skills for which the Norville Group is renowned.

Norville concludes by saying: ‘Norville understands even after 60 years they are an unfinished business, perhaps if they were it just wouldn’t be interesting to stay around any more.’ ●