



In this month's Words from the Workshop, Rob Barrow looks at the potential impact of future technology on the optical lab

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# Labs with no limits

In last month's Word from the Workshop, we considered the importance of communication between technicians and their professional colleagues within the lab. Now, we shall consider the potential impact of technology, i.e. 3D printing, on the lab of the future.

When we talk about 'thinking' about the impact of future technology on the practice workshop, what we really mean is 'rethinking'; rethinking everything we have previously done within the realms of tradition and starting again using our imaginations. Take a few minutes to consider how our imaginations and technology can help us to solve a problem, rather than a relying on a standard product that will just about do the job. We have already begun to unlock the advantages of technology, but before we reached the point of advantage we travelled through just about every disadvantage.

**3D PRINTING: IMAGINE THAT**

So, how does 3D printing work? Let us use a comparison to demonstrate. If we take a photo with a 5mp camera and print it, the result is a low-resolution image. Now, if we take the same photo with a 15mp camera and print it with the same printer, the difference is obvious. This is where the challenges with 3D printing starts: the better the software, the better the digital file created for printing. This is a critical part of the technology's evolution; however, the best software is only available at a huge premium.

Software capable of designing and testing the most intricate of mechanical movements is necessary for practitioners to perfect their designs. However, the hardware or printer is still waiting to catch up in its accessibility and ease of use. It's true to say there is still no simple-to-use method of 3D printing commercially viable parts within the practice. This will, without doubt, change and we will all have access to printers with a plug and play simplicity and materials fit for use within the next decade.

The advanced industry is printing in titanium and stainless steel, with ceramic being the final golden egg to perfect. Will we be at a point where a clinic can instruct a lab to supply a spectacle aid or fitting, and a file will be emailed back for in-house printing? In theory, we're already there. There is no reason to prevent that from happening within our own profession, but it's not realistic to expect every practice to devote the time to toil over the expansive settings of a 3D printer. But we can now look at forming a databank of template files for clinics. A specialist clinic



Figure 1. 3D printed bespoke balloon dog clip-on

requiring side shields, moisture chambers, ptosis props or special end fittings on a regular basis can now select a range of frames to have pre-designed templates – and final instructions can now be undertaken via email.

Readers who follow the ABDO Facebook page might be familiar with the following story, as recounted by Richard Smith of Eyemasters Opticians: "I spoke to Rob regarding what seemed to be a frankly ridiculous request from one of my customers: a 'high end' international entertainer wanted a pair of spectacles that reflected what he did for a living, word having got around locally that we handled 'the unusual'. This involved the 3D printing process to create a fabulous 'clip-on' featuring balloon dogs (Figures 1 and 2).



Figure 2. Entertainer, Danny the Idiot, wearing his 3D printed specs



Figure 3. The ABDO logo, 3D printed at 100% Optical

"I hadn't expected Rob to react positively to this request, but he took it in his stride – to my surprise and my customer's gratitude for even having the conversation in the first place. This kind of attention to very specific detail is what I've come to expect from Rob and his attentive staff, who all seem to understand the value of the company they work with and the customers they serve. The limits of your imagination would seem to be the boundary here; you can lose nothing by having a topical conversation with Spec-Care if you have a specific project in mind."

#### NEW DAWN FOR TECHNICIANS

The advent of commercially viable 3D printing technology has been noticed and embraced by Spec-Care and Norville Optical. Both companies have been jointly working on a new dawn for the frame technician, using technology and engineering to advance the quality of frame adaptive services.

In January, we took one of the printers to 100% Optical in London and embarked on three projects to demonstrate the scope of the technology. The first project was to design and print ABDO's logo with a good colour representation. Those attending the show on the Saturday or Sunday may well have seen one of the prints emerging during the day. A short video is now on Spec-Care's Facebook page, with a final print now resting at the ABDO College in Godmersham (Figure 3).

The second project was to use a new material to develop flexible, hypoallergenic ear fittings. We have chosen



Figure 5. Image 2 Flexible ear fitting to the new Norville Blitz 45 and 46. Image 3 Moisture Chambers (to follow)

to fit them to Norville's new range of Blitz Bids frames to demonstrate the developments of both companies (Figure 4). The finish was achieved by using polypropylene, a material commonly used in allergy safe bedding and food containers.

The final project was to design and fit moisture chambers to the back surface of a frame. This itself provides a huge number of design complications, but the results (Figure 5) will no doubt provide worthwhile comfort to so many people who suffer from chronic dry eye syndrome.

It's my view that problems are a method of learning, and technology is just another tool to help us evolve and advance our skills. It would be unfortunate to lose traditional skills to technology – and so the interest I have is to blend new technology with our traditional skills to form a comprehensive service. In so many respects, 3D printing can advance final quality and consistency, but traditional manufacture allows the technician to get a true feel for the materials, problems and solutions passing by the workbench.

We are on a journey as technicians and you can follow us on social media @SpecCareLtd to see where these new techniques take us.

**ROB BARROW FBDO SMC(TECH) has worked in optics since 1992, firstly as a technician and later as a dispensing optician. In 2002, he purchased Spec-Care, a frame repairs workshop in Exeter, and is the company director.**



Figure 4. 3D printed strap fitted to Norville's Blitz Kids K046c2