# Fine Art Printing
## Introducing the Lockdown Locker

**Note this feature was electronically published ahead of ink on paper printing as part of The Societies' quest to keep our members busy and engaged during the Corona Virus lock down. We have also provided additional material in the Lockdown Locker to keep you all out of mischief!** *https://thesocieties.net/lockdown-locker/*

One of the projects we listed for things for locked down photographers to do was to learn fine art printing. This has the same basic approach as any other photographic printing except that when it comes to reproduction and limited-edition printing, a higher level of control is required. The first thing to emphasise is that it is relatively hard to make a living from fine art print sales, very few manage it. But this is also true of professional photography in general – it too is also difficult to make a serious living at and many fail to do so but having said that the talented rise above the crowd. The fine art print has more market penetration in the USA where, traditionally, more limited edition prints and originals are purchased to hang in homes than the UK. Some parts of UK have yet to progress beyond the *Chinese Girl*, copies of which are still occasionally seen in chip shops*. Undaunted we continue our mission to get more quality prints out there. We should say at the outset that the original germ of the idea was planted by **Christy Lee Rogers** when we saw her venture to publish one of her fabulous prints as a limited-edition and donate the proceeds to *Save the Children* and *No Kid Hungry* (see opposite). Such a worthy cause and such a fine photographer, we wish her every success with the venture. Do visit her website, it is rich with fabulous images and a really interesting BTS film of her working.

The world of the print is a bit like life – it covers a wide range of characteristics. At the top end a Pablo Picasso print (*The Frugal Repast*) sold for £1,945,250 in 2012 and a Toulouse-Lautrec reached $12,485,000. These are very much the cream on top of the milk and some distance from the realities of the average photographer. It is also important to be realistic about the differences and values of the various print technologies. Ink jet printing, even though its fidelity far outweighs anything that artist can do suffers from its ability to produce at limitless capacity. A classic lithograph is technically limited in its print run because it suffers wear after every impression until the block (and its waxed image) is spent – the purchaser of such a print has the certain knowledge that not a single print more can come into existence once the plate is finished with. This is not a guarantee that can be attached to a digital print and this reflects in the value. The best that the print buyer can hope for is the good-will and reputation of the artist. Even this has caveats, for if the edition has a limit of say 250 prints but they are 'printed on demand' the digital file could be in existence long after only a fraction of the edition was sold and indeed sales had dried up. This is a good reason to strictly limit the edition size, if only five are to be made then all can be printed in the same run and the job is finished. The dilemma then exists for the creator – do I keep an archive of the file or delete it? This is a philosophical argument; traditionally the Artist Print is made outside of the print run and signed AP to differentiate it from the edition and retained by the artist (but is this the same as keeping the digital original? – personally I doubt it!).

The way around some of these dilemmas is to restrict your output to prints that are bought purely because they are attractive (certainly to the purchaser) which is why any gallery will tell you that prints of scenes local to the gallery sell well, followed by scenes that the purchaser is likely to be familiar with (eg Venice – 'It's where we had our honeymoon' sort

of thing!). You may have a burning ambition to satirise Trump but that is unlikely to keep the wolf from the door (although a print on the door might!). It probably explains also why monochrome, silver halide prints of naked women are the top sellers at auction. This tactic of selling what is attractive to the purchaser is also reflected in images of cartoon cows, meerkats and hares which always sell well. The message then is that you should create art that has appeal – general appeal!

If you examine the photographer's skill set and assign value to it then the ability to both reproduce and print limited editions is high up the list. As photographers we have the skills to scan or photograph originals, colour correct them, and colour manage the print workflow for high-grade output. If you have an ink jet printer available for say wall portrait printing then it is likely to have quite a lot of idle time which can be picked up by printing for artists. To differentiate yourself from any other outlet your best weapon is quality – provable quality. This comes from the availability of superb colour management tools that are now available at desktop/home studio level. My own experience with many framing specialists who have an old ink jet in the corner is generally poor. The colour management skills are generally absent, they think little of using any old ink set and the cheapest paper they can lay their hands on. Some of the results I have witnessed almost beggar belief – trust me there is not always much to beat out there.

The limited edition process breaks down into the following activities:
1. Scanning and photography
2. Detailed colour correction and file preparation
3. Paper Choice and print size decisions
4. Colour managed printing and auditing
5. Decision on edition size
6. Certificates of Authenticity
7. Signing and stamping
8. Keeping records
9. Print on demand issues

## Scanning and Photography

If the art is a digitally created file from a camera, a painting program such as Corel Painter, or a Photoshop creation (either montage or painted) then this stage can be skipped.

There is a slight possibility that a transparency or colour negative will be provided. If so, proceed with extreme caution! Despite claims by some dinosaurs that film is better than digital (yes, they are still at large) nothing could be further from the truth. However, it might be all that is available, in which case explain the pitfalls and limitations of the process and agree how you are going to proceed, and how the venture is to be costed and paid for. It is likely to take you twice as long as you expect! These remarks do not apply if the ultimate piece of art is a hand-made platinum print; they are to some extent the gold standard (platinum or palladium standard in fact) including when they are made by contact printing a digital negative. They are today's iteration of one of the oldest photographic printing methods.

If you have artwork, things are a little easier as you have a standard against which to judge your final reproduction. First though you have to decide between scanning and camera reproduction. Either way the artwork has to be removed from its frame – essential for scanning, but just about negotiable for camera repro. If there is glass in front of the artwork and it cannot be dismounted, then all bets are off and you have to negotiate on a best endeavours basis. At this point it should be noted that you need 'goods in trust insurance' for the time the art is in your custody – either against damage or theft. Only experts should dismount valuable artwork from its frame anyway.

# Christy Lee Rogers
## *Venus Rising*

Dedicated to the young victims of Corona Virus

*Save The Children* and *No Kid Hungry* Charities

**DONATE TODAY AND BUY *VENUS RISING***

https://www.christyleerogers.com/

**Editions and Sizes of *Venus Rising***

21 x 30"    (53 x 76cm)        Edition of 200        Paper $1,111
28 x 40"    (71 x 101.5cm)     Edition of 100        Paper $1,555

All prints are made on Hahnemühle 100% cotton 315 gsm watercolor museum quality paper.  Rolled and packed in an extra sturdy tube. Shipping will take place within 3–6 weeks, or as postal services are available and open.  Your print will come signed on the back with a special Corona virus note from Christy.

*Christy Lee Rogers* is an International underwater artist from Hawaii who last year was selected as Open Photographer of the Year for the Sony World Photography Awards. She was commissioned by Apple to make a series of photographs using the iPhone 11Pro and Apple made a behind-the-scenes process film about her. *The Independent* of London compared her underwater photography to the works of Caravaggio, Delacroix, Rubens and Titian.  And CNN had this to say about her works "Rogers is changing the way water is used in photography to create images that can easily be mistaken for paintings and that push the boundaries of reality."

# Fine Art Printing

## Scanning

Flatbed scanning is preferable for a water colour or any other 'flat' artwork such as pencil, crayon, pastel or smooth acrylic. Even so you should seek permission to lay the artwork onto your scanner platen before you start. The chances of an image fitting onto an A4 flatbed scanner are not high but it is easy to perform multiple scans and montage the results into a single file. We have successfully done this with 12 images, although it is useful to be able to remove the scanner cover to do this. Also make sure you have a clear working area that is spotlessly clean and if your scanner is sunken level with the work surface so much the better. Important pointers are that the scanner colour corrections should be turned off so that all the scans are graded identically and then for best practice a scanner calibration profile assigned to the assembled file. Scan at your highest bit-depth and about twice the resolution you need in the final image. Turn all the auto features such as sharpening and dust removal off. Aim for at least an inch of overlap between scans if you are montaging. When all the scans are complete and, if necessary, rotated by 180°, from Adobe Bridge click Tools>Photoshop>Assemble Files into Photoshop Layers. Then from within Photoshop click on all the layers in the Layers Palette then click Edit>Auto-align Layers and hopefully the job will montage correctly. Manually adjust the positioning if required then check very carefully for any residual mismatches. Then Click Edit>Auto Blend Layers, make one final check and then flatten the image and save it as 'uncorrected master'. Assign your scanner profile (see box out) and then convert to profile with an output target of either ProPhoto RGB or AdobeRGB (if you have more than say eights inks on your printer, you might benefit from the extra gamut by using ProPhoto RGB otherwise Adobe RGB is fine – avoid sRGB with its slightly low gamut volume).

At this stage you may need some final tweaks to the levels of the image, especially for watercolours for the following reason. If your file is close to a perfect reproduction and the original watercolour is on a creamy, off-white paper then this will be reflected in the scanned file – the paper-white parts of the painting, the highlights, should be creamy too. Now if you eventually print onto a creamy art paper then you have the cream of the file added to the cream of the paper, which could be too much. If this



*An 8-up scan of Liverpool artist John Christianson's original watercolour. This job was particularly tricky because there were few good lines for the software to grab onto when montaging.*

is the case use levels and pull the highlights (right-hand slider) in enough to bring the highlights to 255 so that no ink is put down by the printing and the ink jet paper provides the correct cream tonal value to that part of the reproduction. Experience has also taught us that, when offered a little more contrast (by pulling the shadow slider of levels inboard a tad), the artist will prefer this. Of course, if you are reproducing your own work you can do what you like! We will cover any residual errors later.

## Camera Reproduction

Camera reproduction may be essential if the original contains heavy brushwork (impasto) even worse if it has been executed with a palette knife. Vertical camera stands are available for the task, although they might be insufficiently tall to take in a large image in which case a four-up montage might be required. If that fails, then setting up the original on a wall and shooting from a tripod is the best option but bear in mind that alignment is critical and set up can take quite a long time. We will talk about residual geometric corrections later.

The camera should be set to manual exposure, manual white balance and manual focus (we often tape the lens barrel to prevent movement of the focus). The exposure should be optimised with a grey card or, even better, by using a Macbeth SG Chart and a tethered set-up so the exposure can be doubled checked in ACR. Shoot Raw at the highest resolution the camera is capable of (normally its lowest ISO, but check). If you are intending to enlarge the print compared with the original do the sums to ensure that you have enough resolution (although in our experience paintings are more forgiving as the fine detail is relative coarse in comparison to photographic resolutions). Shoot a Macbeth chart at either end of the sequence and use this to perform a calibration that can be applied to the Raw files. Within Raw, apply chromatic aberration correction. The lens should preferably by a specialist manual macro lens which is better corrected (the 'drawing' of the lens as it is known). Using a zoom lens be sure to apply the lens profile in ACR to correct geometric distortion. Montages from zoom lenses are likely to fail due to geometric distortion although you should be OK with a single shot.

From the Macbeth target image make corrections to white balance, exposure levels and then apply the calibration profile either as an assigned icc profile (preferred) or as a DNG Profile. i1 products can do both. Once all the Raw files are processed they should be assembled as described for scanning if multiple shots have been employed.

## Lenses



Providing you steer clear of wide-range zoom lenses you should be OK for single frame reproduction. However, the specialist lenses such as the 55mm f2.8 Nikkor were specifically corrected to produce lowest distortion at A4 reproduction scales. There is also the issue of working distance which can be a problem; if a stand is used for the task it might require considerable working height and you are likely to need mechanical stabilisation to reduce flexing. We first wrote on this topic in 2003 and the diagrams remain pertinent today, the laws of optics don't change (see the Lockdown Locker resources). However, technology does change and the in-built profile handling of Adobe Camera Raw (or DxO for that matter) corrects any residual geometric distortions quite well. We would

*The 24–70 f2.8 (left) has good distortion correction, the 24–120mm f4 (right) is only really suitable for holiday snaps where its versatility is a boon.*

be very reluctant to use our 24–120mm f4 Nikkor for reproduction but the 24–70mm f2.8 zoom we previously owned was actually quite good on distortion. The bottom line to this is that most of today's 'professional lenses' will do a reasonable job if used within their limits.

One thing that technology has brought is the really high-resolution camera chips delivering up to 50mp; that compares with the 6mp we had in 2003 when first writing about fine art repro! An outcome of this additional resolution is that Photoshop adjustments such as rotation, transforms or geometric corrections are far less pixel-damaging. If, when reproducing a heavy impasto image it is catching the light regardless of what you do, it is possible to shoot at a glare free angle and then pull the distortion back using the transform tool. Don't forget with an image that has lots of impasto that the repro lighting should be biased towards a top light so that shadows are cast down the image in the way a painting would.

## Calibration Aids

We have written extensively on this topic and resources are available in the Lockdown Locker. It is, however, worth compiling an up-to-date summary. If you are reproducing images professionally it is reasonable that you should invest in the highest accuracy kit that is available. This can be provided by a Macbeth SG target and an i1 Profiler software for we can say (and demonstrate) that nothing is quite as good when it comes to scanner and camera calibration. There is a hierarchy of accuracy that starts with a grey card, runs through various 'devices' and targets and ends up at the Macbeth SG in conjunction with i1 Profiler Publish. This combination is near perfect, delivering errors in our tests of 1.22ΔEoo in a scanner (Epson V750) and 1.6ΔEoo for a camera calibration (most DSLRs). Both of these values are just above the detection threshold. The profiling software will also produce bespoke icc printer profiles that
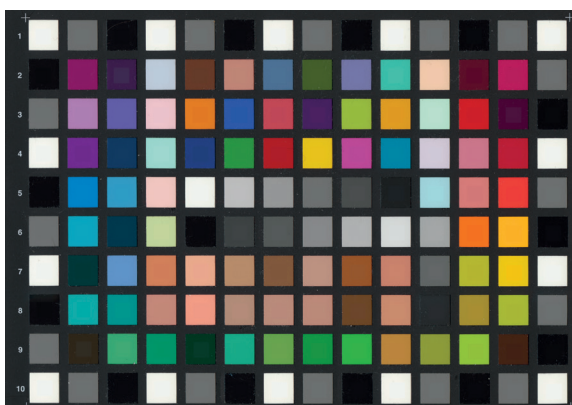
can deliver printer accuracies of the same order (the best to date are around 1.5ΔEoo) with gloss, lustre or proofing papers. Even this quality can be exceeded if you employ a GMG RIP to print but that does move you up quite a notch on the money stakes (north of £5,000 just for the RIP!) however, it did produce errors of just 0.62ΔEoo.

In summary the hierarchy of accuracy at the capture stage runs as follows:

| Method | Average ΔEoo | | |
|---|---|---|---|
| | Test 1 | Test 2 | Test 3 |
| ACR Adjusted | 3.9 | 3.8 | |
| Passport CC | 3.5 | | |
| ACR Calibrator | 3.5 | 2.2 | |
| Spyder ColorCheckr | 3.9 | | |
| I1Profiler to SG | 1.6 | 1.8 | |
| Ditto match 2109 | | | 1.2 |
| Expo Disc | | 4.6 | |
| ACR to Macbeth CC24 | | 2.5 | |
| X-Rite Passport | | | 3.8 |
| ACR Calibrator and Passport | | | 2.2 |
| DNG to Passport Checker 2 | | 4.7 | |
| Passport 2 to SG | | | 2.6 |

Most of the devices listed above have been reviewed in *Imagemaker* and are made available in the Lockdown Locker.

## Detailed Colour Correction and File Preparation

If a piece of your own art is being printed for sale then much of the above has less relevance. It is matching the print exactly to the original and to the satisfaction of the artist that is the great challenge. Metamerism is the enemy at this stage for although we might be reproducing at accuracies of less than 2ΔEoo the metameric errors can be much greater than this. In detailed tests, conducted in 2006, we measured the actual oil pigments being used by artist Penny Warden as we assisted her fine art printers who had been experiencing problems matching the colours. The metamerism values were high in comparison to the accuracies that the ink system was capable of. The table below shows the pigment metamerism and the metamerism of the reproduced tones in the print (as *Lab* values and not using the methods we employ today).

| Metamerism Index | | |
|---|---|---|
| | *Lab* ΔE D65 to Tungsten | |
| Colour | Oil Pigment | Epson K3 |
| Orange | 12.1 | 11.2 |
| Orange red | 16.0 | 15.2 |
| Red | 15.8 | 15.3 |
| Deep red | 8.4 | 5.0 |



*The X-rite Macbeth ColorChecker SG has no real parallel for calibration purposes – here in use calibrating a scanner of an average error of just 1.2ΔEoo, the errors are superimposed but almost invisible to the eye.*

# Fine Art Printing

More recently we looked at metameric index measurements on a range of ink jet prints from the HiGAM series we employ for colour auditing. The Colour Inconstancy Index for the Epson 4900 and Epson 7500 ink sets are shown in the first column and generally the print errors are under 2ΔEoo whereas the metamerism index ranges from 2ΔEoo up to 8Δoo – in other words the error due to metamerism overwhelms the error due to printing!

One reason that this variability from metamerism is important is when an artist has used different pigments in their painting to mix an apparently identical colour which then scans differently due to the metamerism of the scanner fluorescent tube. This is why this section is sub-headed 'Detailed Colour Correction'; when faced with such challenges there is sometimes no option other than masking the image and applying selective colour adjustment where these anomalies crop up. It is quite detailed work involving fine adjustments and accurately made Photoshop masks on Colour Adjustment Layers.

Assuming that all these issues are resolved to the limits of the technology we are ready to print!

| Colour Name | CII | CII |
|---|---|---|
| Printer | 4900 | 7500 |
| Yellow | 3.44 | 3.6 |
| Orange | 3.72 | 3.68 |
| Red | 6.42 | 6.48 |
| Magenta | 7.97 | 7.86 |
| Purple | 4.59 | 4.91 |
| Blue | 2.84 | 2.74 |
| Moderate Blue | 2 | 1.62 |
| Cyan | 5.08 | 4.57 |
| Turquoise | 6.25 | 5.74 |
| Blue Green | 7.3 | 7.27 |
| Green | 7.74 | 7.76 |
| Lime | 7.57 | 8.01 |
| Yellow green | 6.6 | 6.85 |

## Printing, Profiling and Colour Auditing

The icc profile is used to colour manage the output from a printer and is an essential part of the workflow. As with calibration aids there is a hierarchy of workflows and their overall accuracy. For icc profiles, starting with the worst the list is as follows:

| WORKFLOW | ACCURACY RANGE* ΔEoo | |
|---|---|---|
| | Gloss (Pk) | Matt FA (Mk) |
| No Colour Management | 6–16+ | NR |
| OEM Profile from the Printer Driver | 4–6 | |
| Generic Profile for a third-party paper | 3–6 | |
| Bespoke profile for your paper and printer | 1.6–4.0 | 2.8–5 |
| Bespoke Profile with full audit and adjustment | 1.6–3.0 | 2.8–4 |
| GMG Four-dimension profile build and calibration with iterations | | |
| Iteration 1 | 3.10 | NR |
| Iteration 2 | 1.11 | NR |
| Iteration 3 | 0.62 | NR |
| *The values are typical across 20 years of testing | | |

There are some basic rules that should be followed when attempting to work at the higher levels of accuracy:
- Always install accredited ink of OEM specification.
- Always start the session with a printed nozzle check.
- Always profile build and then print at 'Maximum Quality' settings with an appropriate (and recorded) media setting with bi-lateral (high-speed) printing turned off and an appropriate platten gap. Ensure that settings such as Black Point Compensation and Rendering Intent are obeyed and are consistent with the audit printing workflow.
- Ensure that the correct profile is used (and double check sometimes the settings are not sticky!). We have had clients use say Epson 3800 profiles left on their computer after they have installed their new Epson 3880. It does not end well!

- Audit your output by measurement if you can; it is the only way to check for certain that all is well.
- Examine every square inch of the print with care before signing and curating it. Destroy any substandard prints.
- Retain at least one print as a reference proof and store it in a cool dry dark space.
- If you are printing on demand either re-audit the output to confirm calibration is sticking or at least make a careful comparison with the retained proof print.
- Beware of high temperature and humidity fluctuations and that profiling and auditing are carried out in typical/similar conditions. At Imagemaker we lost control of our proofing accuracy during a spectacular heat wave some years ago, something that also happened to our offset press printer at the same time (they had to bring in air conditioning to their proofing room to get back on track).

## Auditing

The only way to be sure that your printer is working correctly (and consistently) is to measure the output and compare it against a standard. This is built in to i1Profiler which can use a number of European, Japanese and US standards intended for the contract proofing market. They serve admirably for most other purposes although at Imagemaker we have created our own test target which reflects an attempt to reproduce very high saturation colours which are occasionally found from acrylic pigments. One advantage of this method is that the test patch set can be tagged onto a print (especially when printing from a roll) and then audit the result before either trimming the target off or leaving it on for a proof.

In the example shown we were auditing the front cover proof for the June–July issue of *Imagemaker*. The audit process was completed in 1m05s and delivered the assurance that the print was spot on. If required, the verification label can be printed to our label printer and attached to the proof. Such verification can be a boon when a client is arguing about the reproduction, once you can explain that the proof is almost perfect the discussion can move on.

## Paper Choice

Now the paper has to be chosen. Sometimes the author will specify the paper they would prefer and if so, the decision is made! Oftentimes the printer can make suggestions and have samples available for test printing so that the artist can choose. Other times the artist may be looking for the printer to provide advice on paper choice. As the expert you should be able to demonstrate both knowledge and experience on papers and their properties. There is one golden rule – gloss, lustre and semi-matt finishes (including the barytas, let's call them GLSBs) produce prints that are brighter, have higher colour depth and more pop all round. If you make the mistake of showing your client a GLSB version and a matt art finish they will want the high gamut colours on a matt paper and that is never going to happen – all you are doing is setting up to fail! You have to educate your clients at the start of the process (and that might include the option to gloss varnish a matt paper).

We could devote the remainder of the magazine to paper choice which is why we have made a variety of resources available in the Lockdown Locker. For fine-art printing the first option is a zero OBA, matt finish, archival grade, lignin free media with a weight of at least 250gsm. Preferably it should be from a recognised mill (because you are going to have to specify where it came from on your certificate of authority). Surface finish is optional but a good rule of thumb is to go for a smooth finish if the image thrives on detail, a watercolour rough finish if you are reproducing a painting (water colour or pastel). If the subject is purely photographic (whatever that means!) then you might look at a GLSB but once again avoid OBAs if at all possible. Our own go to media would be the new Canson Baryta Photographique 2 (reviewed in this issue) or PermaJet Fibre-Base Gold Silk 315 as they are both OBA free neutral finishes with spectacular accuracy and deep, rich colours.

One of the issues with specifying a paper is the number that we have to choose from. There are many hundreds and frequently a media is a re-boxed version from the same source. One thing we always warn against is 'being seduced by the example print'. By this we mean choosing a paper on the basis of a print you have seen and admired – it might not perform so admirably on your particular image! The makes and distributors of

paper supply medley boxes of papers for particular purposes which are a valuable source of test samples. You could do worse than buying a box and printing the same image on every sheet to show to a client or assist in your own decisions. One useful piece of advice is that if you can cope with roll material do so; it is far less hassle than feeding sheets which can sometimes get a little curly with storage! The best place to look at test packs is On-line Paper (***https://www.on-linepaper.co.uk/test-packs-and-other-services/test-and-sample-packs***) because they supply a wide range of papers from many mills and distributors. Initially we had ambitions to list the packs but it rapidly spiralled out of control!

By way of example we have pulled out the Canson offering for fine art:

We could have shown you similar offerings from Awagami, Canson, Epson, Fotospeed, Hahnemühle, Ilford, Innova, Olmec, PermaJet or St Cuthbert's Mill. If that lot can't keep you out of mischief during lockdown nothing will! One thing we can say with some certainty is that most papers perform within the same sort of error band when they have been well profiled. If you use manufacturers or third-party profiles and the match is poor you may see a deterioration in performance (and conversely if the match is good so will be the result!)

| Canson Discovery Pack Contents | |
|---|---|
| **The Canson® Infinity Discovery Pack Fine Art Photo include 10 sheets :** | |
| **Platine Fibre Rag 310gsm** | 100% Rag, ultra smooth glossy, pure white, without OBAs. |
| **Baryta Photographique 310gsm** | True Baryta paper developed for inkjet, Pure white(2010 TIPA Award) |
| **Baryta Prestige 340 gsm** | It is a smooth Baryta Gloss paper which evokes the look and aesthetic feel of traditional darkroom papers (2017 TIPA Award). |
| **Photo HighGloss Premium RC 315gsm** | alpha cellulose resin coated, ultra white and ultra smooth with the highest gloss level of the RC paper market. |
| **PhotoGloss Premium RC 270gsm** | alpha cellulose resin coated, glossy, ultra white. |
| **PhotoSatin Premium RC 270gsm** | Resin coated Satin, Extra white. |
| **PhotoLustre Premium RC 310gsm** | Exceptional strength, Excellent true lustre surface, Extra-white, High opacity, (2015 TIPA Award) |
| **Rag Photographique 310gsm** | 100% rag – ultra smooth, ultra white paper, without OBAs. |
| **Rag Photographique 210gsm** | 100% rag – ultra smooth, ultra white paper, without OBAs. |
| **Rag Photographique Duo 220gsm** | 100% rag, ultra smooth, double-side coated, ultra white paper, without OBAs. |
| | |
| **The Canson® Infinity Discovery Pack Fine Art include 9 sheets :** | |
| **PrintMaKing 310gsm** | 100% rag, Mould-Made, smooth, pure white paper, without OBAs |
| **Velin Museum Rag 315gsm and 250gsm** | 100% rag, Mould-Made, smooth, pure white paper, without OBAs. |
| **Edition Etching Rag 310gsm** | 100% rag, smooth, ultra white paper, without OBAs. |
| **Rag Photographique 310gsm and 210gsm** | 100% rag – ultra smooth, ultra white paper, without OBAs. |
| **Rag Photographique Duo 220gsm** | 100% rag, ultra smooth, double-side coated, ultra white paper, without OBAs. |
| **Aquarelle Rag 310gsm and 240gsm** | 100% rag, Mould-Made, smooth, pure white paper, without OBAs. |

but that is why having your own profiling kit is by far the best solution.

## Decision on the Edition Size

This refers to both the number off and, physical size of the print and the size of the printed area – all are normally referred to in the certificate of authenticity which should accompany a print sale. The number of prints that you elect to issue is always a tricky guestimate at best but once the edition is launched it is fixed, you cannot decide 'that sold well' and bung more into the system for that devalues what you have already sold and is rightly regarded as fraud. You may of course declare an open edition, in which case anything goes and your buyer might respond accordingly in their evaluation of you edition. Some artists start at a lower 'entry' price and gradually increase the selling price as the edition sells out. In terms of numbers 850 is consider by some to be a fair limit for an edition but many artists sell very small editions (as few as three) at high value. All these numbers are hypothetical for a beginner in the market but you might reasonably ask yourself how much you want to make on the venture. If for example you sell 10 prints at £200 to make £2,000 does that reflect the work you have put into producing the edition and marketing it? For a beginner an edition of 25 seems about right, remember that if you sold that many at a fair price you would be in profit and you might already be on the way to building a following. One advantage of printing on demand for a limited edition is that you can print a small number and test the market, if the prints don't sell you can always withdraw the final prints by simply not making them.

When it comes to the physical size of the print, bigger is better. If these are high-quality, high-value images they are likely to be displayed and prints have a habit of 'shrinking' when set on a wall. Also, a large print has greater presence and perceived value without too much additional cost to the producer, the raw materials should be a fraction of the correct selling price. The same psychology applies to the border of the print, especially if it is to be sold unframed – it looks more imposing with a four-inch border. Framing is expensive especially if it is archival grade (and it should be!)

and there is a chance that the buyer would wish to match the frame to other prints they own or to the room décor. If you already have a framing business tagged on to your photography then you have the opportunity to provide both frame and print as a bespoke pair of course.

Ultimately the size of the print will depend upon the size of your printer. Many would regard a 24-inch printer as the entry point if you are serious about your work but if you are going larger you have to consider the risks to your return on investment. Conversely if you go too small you are going to have to re-invest if things go well – a larger printer can always be set up with a smaller roll of paper or sheet fed media.
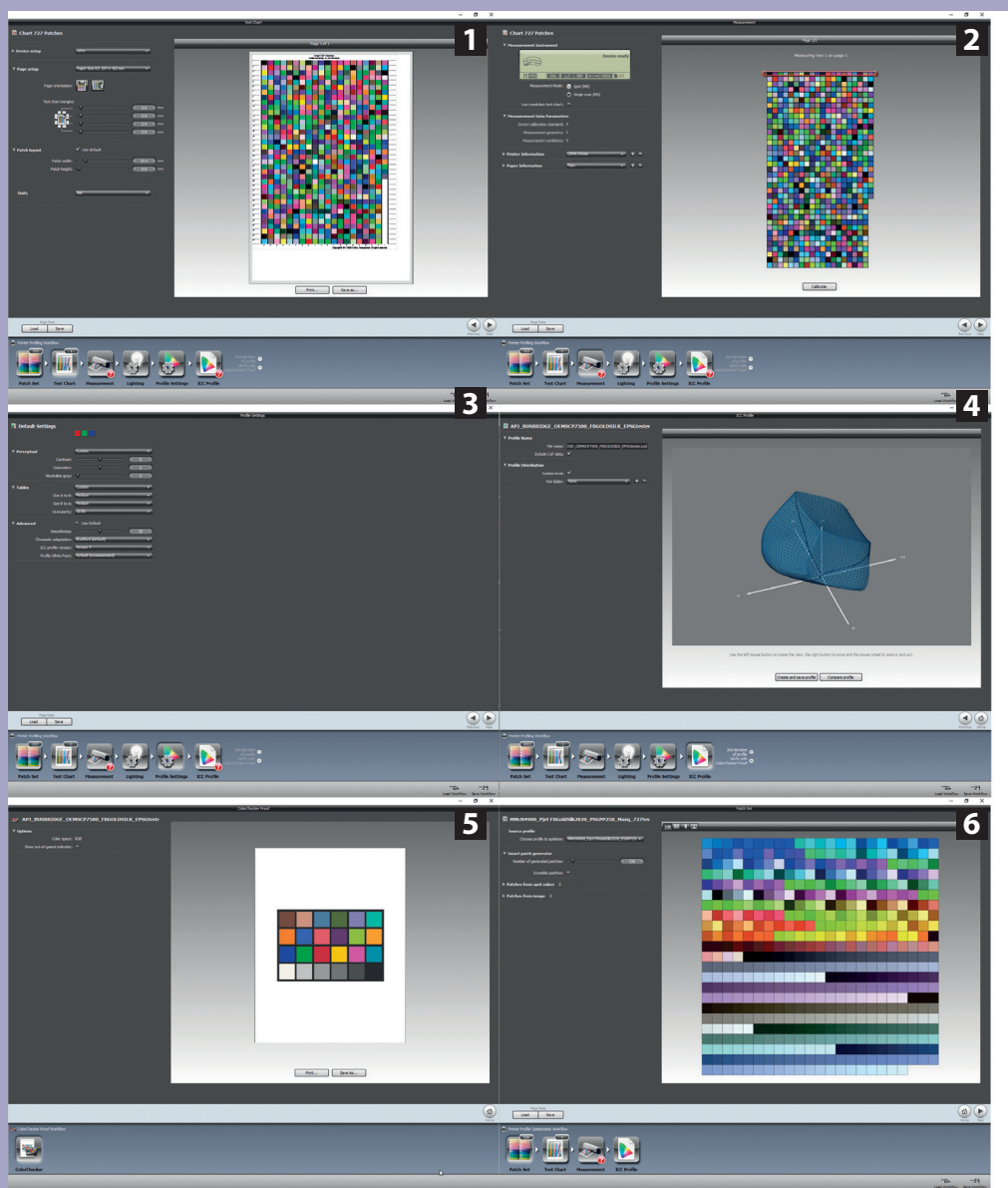
## Certificates of Authenticity

These are common in the fine art print world and solutions are available from Hahnemühle which include paper to print the certificate (watermarked), along with pairs of holograms uniquely numbered, one for the print and one for the certificate. The certificate should contain at least the following information:
   The title of the piece
   The name of the author
   The signature of the author
   The size of the edition
   The number of the print within that edition
   The physical size of the paper and its type
   The size of the printed area
   The date
   The ink media used

Hahnemühle also provide a service for registering your artwork with them at
https://www.hahnemuehle.com/en/digital-fineart/my-art-registry.html.

# Profile Building

Icc profiles are the DNA of colour management – they control what happens to colour as it moves around your system: replicating, reproducing and creating colour for either display or printing. For something so powerful they are, at heart, relatively simple, existing as simple text files which describe how a colour should be set up for display or printing so that it looks correct. Like DNA, the profile is unique to the 'system' that it was created for. So, for example, a profile for the Imagemaker office Epson 4900 is specific to that machine, ink-set, paper and all the settings that go towards creating a print. The profiles are not, however, unique to our operating system – a profile can be made on a PC and then used on a Mac and vice versa. If we sold the 4900 to somebody, we could transfer all the profiles and it would perform in an identical manner in its new home.

There are a relatively small number of profile-making applications and the two most common ones in photography are those from X-Rite (the i1 systems) and Datacolor (the Spyder systems); http://www.color.org/profilingtools.xalter lists the main players). They all work in the same manner, you print out a set of coloured patches from a defined source, then measure the patches with a spectrophotometer and then the software makes a profile which is automatically installed on the host computer in a special location reserved for colour profiles.

The profile build takes minutes (rather than hours) to complete and the measurements can be made either by the operator dragging the spectro across the sheet in an ordered fashion or with fully hands-off, automatic measuring devices. The automatic devices work a little bit like a laminator, you feed in the sheet and it does the rest! Although the process looks daunting it is actually very simple and on our i1Publisher version we normally leave all the settings at default although we do have to specify the number of patches to use and the sheet size we are to print to.

The question of how many of patches to use is a tricky one to answer. We standardise on 727 because it is one of the defaults and fits onto a single A3 sheet of paper. If only a single sheet of A4 is available (and for some experimental mill prototypes we consult on there are only two sheets! No pressure there then!), we drop back to 400 patches. The i1 targets will actually go up to 6,000 patches but any experienced profile builder will tell you that sometimes numbers that high actually make an inferior profile – they certainly take for ever to measure! We also scramble the patches to smooth out any variations across the sheet so that all the cyans, for example, are not crowded together. We standardise on default D50 as the illuminant and strongly recommend that you do so too.

Once the profile is calculated and stored it is instantly available in Photoshop for selection from the drop-down menu. The profile should be checked for continuity in the 3-D model you are shown [4] – if there are any lumps bumps or holes you need to begin again with the measurement (not the target printing). The colour can be checked with the simpler systems by printing the Macbeth Target [5] and then laying the control over it. The control has holes in it so that you can compare the print against the reference. This is a subjective measure which we at *Imagemaker* will having nothing to do with (but is still better than nothing). It is possible to take the profile through a second iteration in which additional patches are printed, again this is something we never do, we aim to get all profiles close to high accuracy first time. There is a routine for dealing with OBA activity and its influence on the profile build but this too is a little subjective as the user has to visually determine the best match.

Note that the above is but a small portion of the profile building facilities available from the higher-end i1 systems which also include multiple Pantones as extra channels (and printing plates at the printing house) but are of no relevance to the subject of this feature, the printer driver itself takes care of the additional inks in your printer.

# Auditing Your Print Output
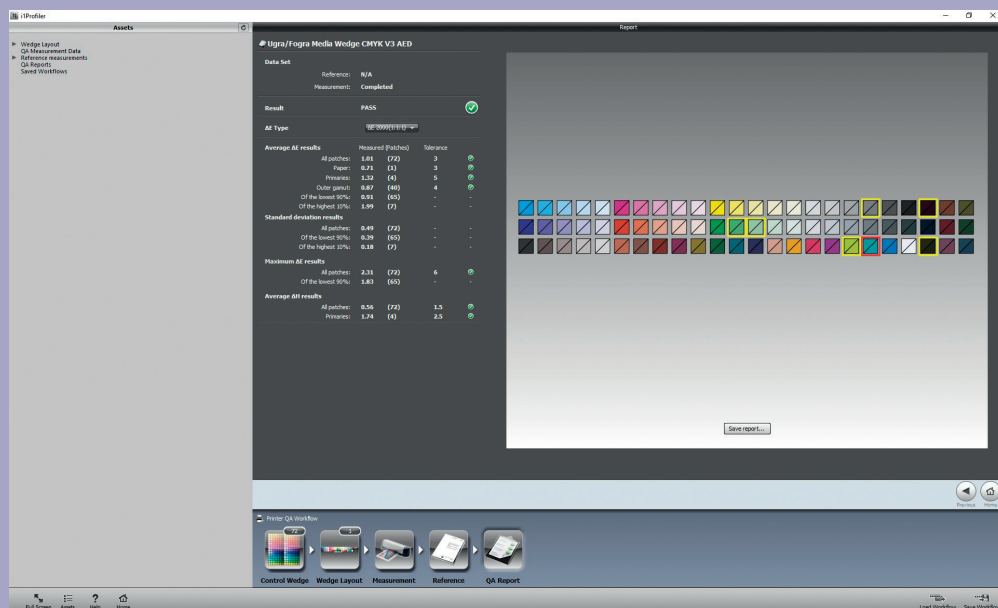


*This is the audit from i1 Publisher on the Fogra/Ugra test patches. The data on the left of the screen can be printed out to an adhesive label and attached to the validated proof. A contract proof must have the label attached. For the curious the error data for every patch is also available – useful for value judgements if a print is only just failing; you can see where the problem lies.*

## i1Profiler — Verification Print

**General Results**

| | | |
|---|---|---|
| Report summary | **Passed.** | 4/15/2020 --- 04:54 PM |
| Patch set | Fogra Media Wedge CMYK V3 AED | |
| Reference | FOGRA39L.mxf | |

| Test | Tolerance | Measured | Status |
|---|---|---|---|
| Average ΔE, all patches | 3 | 1.01 | Pass |
| ΔE, Paper White | 3 | 0.71 | Pass |
| Average ΔE, Outer Gamut | 4 | 0.87 | Pass |
| Average ΔE of the lowest 90% | – | 0.91 | – |
| Average ΔE of the highest 10% | – | 1.99 | – |
| Maximum ΔE, all patches | 6 | 2.31 | Pass |
| Maximum ΔE of the lowest 90% | – | 1.83 | – |
| Maximum ΔE, Primaries | 5 | 1.32 | Pass |
| Average ΔH, colored gray patches | 1.5 | 0.56 | Pass |
| Maximum ΔH, Primaries | 2.5 | 1.74 | Pass |

## i1Profiler — Verification Print

**General Results**

| | | |
|---|---|---|
| Report summary | **Passed.** | 4/15/2020 --- 04:54 PM |
| Patch set | Fogra Media Wedge CMYK V3 AED | |
| Reference | FOGRA39L.mxf | |

| Test | Tolerance | Measured |
|---|---|---|
| Average ΔE, all patches | 3 | 1.01 |
| ΔE, Paper White | 3 | 0.71 |
| Average ΔE, Outer Gamut | 4 | 0.87 |
| Average ΔE of the lowest 90% | – | 0.91 |
| Average ΔE of the highest 10% | – | 1.99 |
| Maximum ΔE, all patches | 6 | 2.31 |
| Maximum ΔE of the lowest 90% | – | 1.83 |
| Maximum ΔE, Primaries | 5 | 1.32 |
| Average ΔH, colored gray patches | 1.5 | 0.56 |
| Maximum ΔH, Primaries | 2.5 | 1.74 |



The built-in audit process for i1Profiler, GMG RIP and EFI Fiery RIP are all based on standards produced for offset printing using various CMYK profiles. A print meeting the standard is by definition of very high quality, far higher than a wet chemistry lab can achieve for example. However, it does suffer from having an in-built limit to CMYK gamuts which are smaller than those achieved by quality inkjet printers. This is particularly true of the maximum black which is limited by the CMYK profile to around 2.2 whereas the inkjet can achieve value of 2.6 in some circumstances. A proof with a maximum black of 2.6 would actually fail as the measured error would be outside the specification. Despite these limitations the offset press proofing standards do represent high quality it is just that the values might need interpretation and will not print a file with the magic word PASS on them!

# Fine Art Printing





## Signing and Stamping

A print should always be signed. The act of signing broadcasts that the author has made the print, is happy with its quality and proud of it! It is problematic if you have an ugly signature and you might consider developing a signature specially for prints and certificates – just make sure it is consistent and repeatable. It also gets around the problem of somebody scanning you signature from artwork and using it fraudulently – the reason why the signature you sign your cheques with should be different!

In terms of what to use for a signature, a soft pencil is best for a matt art paper but might not work on a gloss media. We have tried all sorts of stunts including using ink jet ink in a fountain pen or with a dip pen. The Sakura Pigma Micron Fineliners do a serviceable job, although they lack the character of a nibbed pen.

One way around issues with ink signatures is to use a stamp and impress the print with both your signature and logo. They also look very sophisticated and certainly cannot be erased!

The Lockdown Locker contains a multi-page discussion on this rather complicated topic.

## Keeping Records and Print on Demand

It is important to keep track of the prints you have issued and their numbers especially if you are printing on demand. Printing on demand brings its own set of issues in that you have to ensure that the latest print is a perfect match to those that have already been issued. It is one good reason to print the entire edition in one run. The very least that you should do is keep a reference proof print (usually signed as an AP or artist's proof) and a set of notes detailing the printing parameters used (and keep the notes in a hard-backed book not on a scrap of paper!). There is a danger that a late-printed product will be on a different batch of paper, almost certainly with a different batch of cartridges and, in the worst case scenario, you may no longer have the printer available (they do fail!). Again, this is a reason to print the edition at one sitting and perhaps keep the edition size lower rather than higher so that the tactic is not too expensive. It should be obvious that you should store the master file securely and have secure back-ups as well – regard this as your pension fund! And this goes for your icc profile as well – you could lose it with a hard drive failure or you might even forget to make a note of which profile you employed.

If you are printing on demand each session should be preceded with a nozzle check and auditing of the output if there is a hint of change. To put that in perspective the GMG RIP produces a nozzle check with each print automatically and requires recalibration on an almost daily basis – this is a cost of high-accuracy printing.

## Cherish the Print

Look after your finished prints, handle them with clean cotton gloves and do not allow artist-clients or potential purchasers to handle them (at least not without gloves and supervision!). Your prints are a precious artefact, if you do not show them the utmost respect you can hardly ask your purchasers to do so! It should not need saying but do not allow drinks or any other liquids anywhere near your prints or print storage area



– accidents do happen I have plenty of horror stories about the demise of valuable artwork!

## RIPs

A Raster Image Processor or RIP is a way of sending a file to print without the intervention of Photoshop or Lightroom – they are stand alone. They have several advantages and some disadvantages. They are primarily intended for cmyk workflows that is to mimic on-press performance or to send a file to press to be separated into the four plates of cmyk. Some, such as the GMG, circumvent the print driver altogether and impose their own rosette dot making to better mimic real press conditions. Although RIPs such as the GMG are capable of superlative colour performance they sometimes do not perform as well with detail as a well-profiled printer driven from Photoshop. An Epson driver has no need to mimic a rosette pattern for example and can lay down ink in the most accurate way possible rather than compromising to indulge in mimicry. The advantage of a RIP is frequently because they can nest images, that it sit waiting for the folder to fill with sufficient images and then start printing only when enough are available and they have been arranged in an optimum manner of the roll width available. If that is what you require then Mirage is the best solution for an Epson or Canon printer as it employs the optimised OEM print driver but is very simple to use requiring only limited skills (unlike Photoshop which has many traps awaiting the unwary!). Mirage will also prepare a file for canvas wrap around, adding canvas and colour outside the image area. A review (admittedly old) is available in the Lockdown Locker.

There are many RIPS available including some open source products.

The Wave Form
LIMITED EDITION PRINT
by
*Charles Farnell* ARPS

## Case Study

Even with the best controlled proofing and curating, a print for a limited-edition run is always fraught with pitfalls! We chose to prepare first-offs for one of *Imagemaker's* contributors, Charles Farnell and retain all samples and data. The image fitted our idea of a suitable subject for a limited edition print – it is simple, unusual and attractive ie marketable!

The starting image was a Raw file from an Olympus E-M1X with the M49–150mm f2.8 lens. The exposure conditions were 60mm zoom length, 0.5s, f 22 and an ISO of 64. The shot was taken during Storm Daniel on the Wirral waterfront. The original Raw file was 5,184 x 3,888 pixels in M⅘ format. This was cropped to 4,656 x 3,253 pixels, along with some burning, dodging and colour adjustment to prepare the file.

Our starting point was to assess the capabilities of the file in terms of print size, something you often have to do, more especially when somebody has asked for a wall-print from their iPhone masterpiece (yes they do!).This computed as follows:

| File Dimensions | | | Printed Area | |
|---|---|---|---|---|
| w px | h px | Resolution | Width in | Height in |
| 4,656 | 3,253 | 300ppi | 15.5 | 10.8 |
| | | 250ppi | 18.6 | 13.0 |
| | | 200ppi | 23.3 | 16.3 |

So, we worked out that an inked area of 18.6 x 13 inches world sit nicely on an A2 sheet with a generous border, using 250ppi. The first task was to create a Photoshop file at the required 250ppi resolution at A2 size (594mm x 420mm). We used the File>Place Embedded command to place the original as a Smart Object. We always use a Smart Object in case we have to tweak the size and so can amend non-destructively. It also allows for the downstream option of adding a Smart Filter if any colour adjustments are called for after proofing (prescient as it turned out!).

We eyeballed the placement of the file as shown in the screen grab and then trialled the titling and fonts. The required text consisted of the print title, the author, and the strap line 'Limited Edition Print'. At this stage we also decided that a black key line was required and one was introduced on a new layer above the image. The type was set and optically adjusted with several variants of fonts until we arrived at the final typography as shown in the screen grab. At this stage you should always check (and then double check) your spelling – you do not want to roll out a hundred pounds worth of prints with a typo!





The Wave Form — Times New Roman 30 on 36pt
LIMITED EDITION PRINT — Engravers MT Regular 11 on 20pt
by — Myriad Pro Regular 15 on 27pt
*Charles Farnell* ARPS
Caflisch Script Pro 28pt + lower case Small Caps on ARPS
All text set in 40% Grey (5e5e5e Hex)

In order to create an audited proof we extended the canvas from 24 to 28 inches (it's called a slug) and placed the colour control patches. The media chosen was Epson Fine Art Smooth Cotton Natural from a roll. For this we had a profile already archived from our *Imagemaker* test in January 2019 complete with audit – so we knew what to expect. A nozzle check was printed before we commenced with the proof print.

# Fine Art Printing
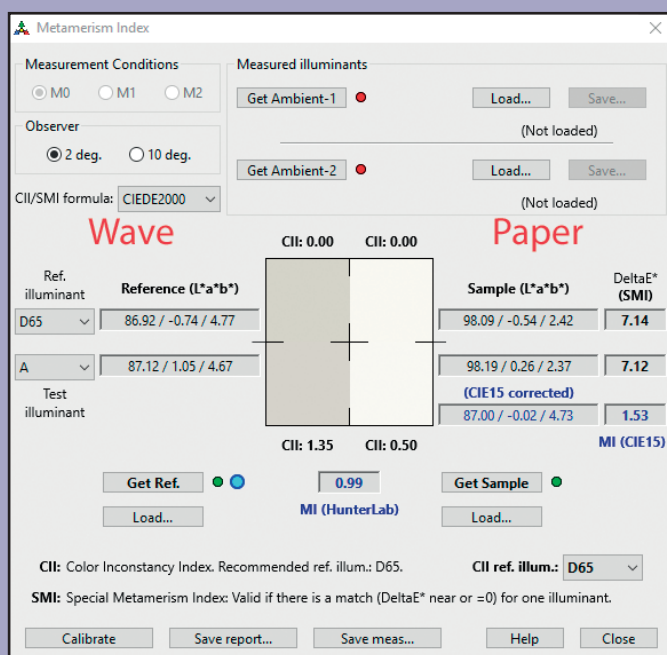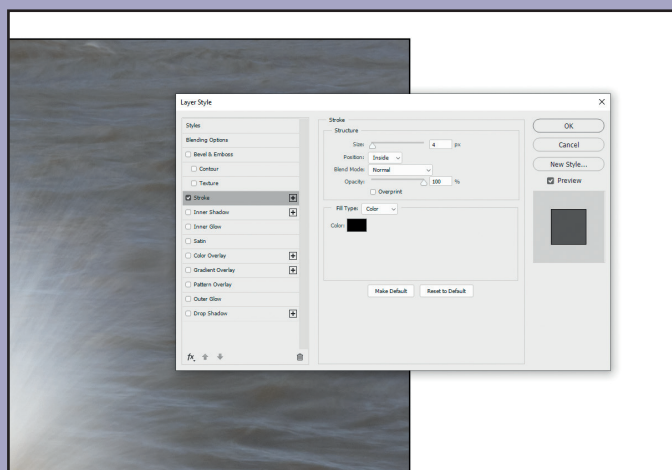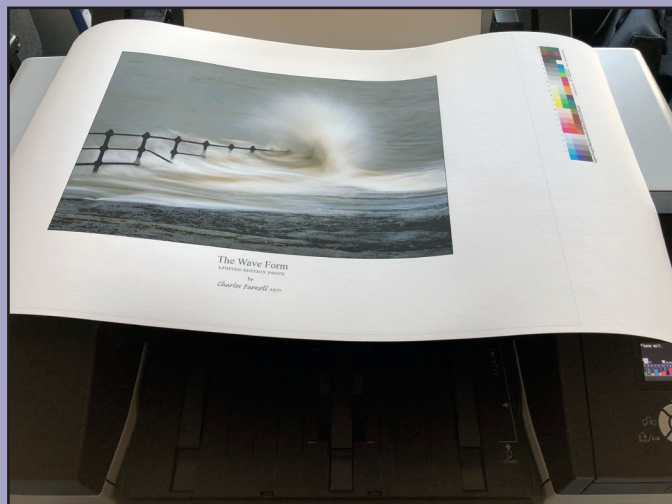








The first print was proofed and it audited within the expected tolerances. However, the underlying cream of the paper was depressing the coolness of the water surface making the visual rendering a little muddy. This is not a flaw in the printing but a real world expression of the adage 'the colormetrically accurate proof might not be the most pleasing print!' We noted that the original file has a water plume (the main feature of the composition after all) that is nearly neutral with colormetric values of 88% *L*, 0 *a* value and +1 *b* value. The profile was shifting this further towards the cream of the paper at 87% *L* but -1 *a* and +5 *b* value.

After some consideration we added a Smart Filter with Raw adjustment and cooled the image by -8 points on the Color Temperature scale. There is no Lab readout in the Raw filter dialogue and the Smart Filter was useful because we could re-open it and increase the setting to -15 points non-destructively to give a calculated shift towards blue of 5 points, to take the plume to -1 *a* and -3 *b* values.

Although these differences are quite small (we have occasionally seen errors of this magnitude in straight prints!) they have a profound effect on the emotional feel of the print. Although the adjusted print is cooler, it looks far more alive and the somewhat muddy look of the Mersey is not necessarily the feel you want to portray (this was not the first time we have run in to trouble with cream papers combined with River Mersey water!). This begs the question as to why we spend so long profiling and auditing the printer/paper if we then throw an optical correction at it with a slice of guesswork. Well, it is all about control. If we know that the printer is outputting correctly (and exactly the same as before) we can print with confidence and who is to say that the image might not be shifted to another media altogether at the request of the artist – then all we do is delete or tweak the Smart Filter and we are back to our secure baseline.

*ABOVE:*
*Some of the stages involved in the preparation of the limited-edition print. Having a spectrophotometer for profiling also enables the user to interrogate the print numerically and make judgements. Here the wave print value is compared with the colour of the paper background.*
**LEFT:**
*Printing from Photoshop requires great care to ensure that the correct settings are employed for every print to ensure the correct colours and consistency.*
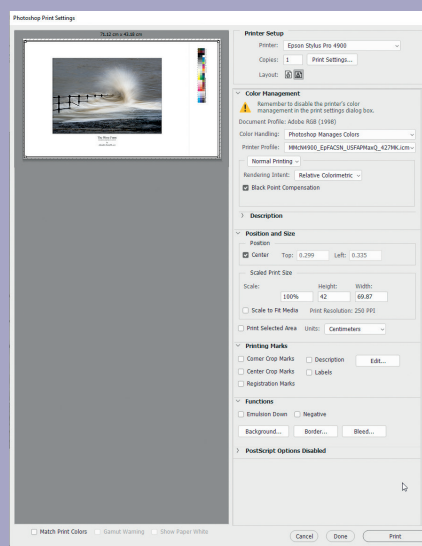
It is also worth calculating the cost of all this proofing. We made four proof prints which, with audit bars, ran to 28-inch runs on 17-inch paper. Including the nozzle checks (at 77p for paper, each time) this totals £28.40 for raw materials alone. Added to the time to produce and measure the audits we are well over £100 before an edition print has been produced – think about that when you are calculating what to charge. Wastage also needs to be considered, one of our proofs had a white mark caused by a shard of paper falling onto the media surface before printing. In this instance it made no difference, but such a print could not be sold in an edition and would have to be scrapped.



## In Summary

It would be unwise to bet your house on making and selling limited edition prints. However, if you follow Christy Lee Roger's lead and produce one for charitable purposes who knows what might happen – good things do sometimes come to people who do good deeds. In any event the ability to produce superlative quality prints is a useful life-skill for a photographer! One sure thing about earning a living from prints is that it is not the quality of your images (we make the starting assumption that they are reasonable quality) that will govern success, it is the quality of your marketing. This is not true of printing for other people where superlative quality should always bring clients to your door. That said we have seen some really dodgy prints hung up far sale, including local scenes hacked out on an A4 printer with hooky ink onto photocopy paper!



*This beautiful image by Carol Tipping FRPS was made in Corel Painter and could be output as a fine art print without any other interventions.*

# Lockdown Locker Contents

| Subject Area | File Name | Date | Contents |
|---|---|---|---|
| **Repro** | FA Repro 2003 | 2003 | Lens selection and lighting |
| | FA ReproCompilation Articles | May 08 | Compilation article across a range of repro challenges and solutions |
| **Calibration** | Camera Calibration | 2006 | Advanced camera calibration |
| | X-Rite Passport | March 10 | Using X-Rite Passport for DNG Creation |
| | Macbeth at 40 | Apr 16 | Extensive discussion of all calibration tools available |
| **Paper** | Paper White | March 12 | A discussion on paper white, measurement and OBAs |
| | Paper Testing | March 10 | Aspects of testing printer papers |
| | Selecting a paper | 2011 | From Epson Print Academy syllabus |
| | Bartyta Roundup2103 | Nov 13 | Compilation of all baryta paper data |
| **RIPS** | GMG RIP | March 10 | The high accuracy GMG Proofing RIP |
| | Mirage Review | March 11 | Easy to use Epson RIP |
| | EFI Fiery RIP | May 13 | The EFI RIP including audit and contact proofing ability |
| **Proofing** | Proofing 2008 | Sep 08 | All aspects of proofing |
| **Mono Printing** | ABWRefined | Sep 12 | Epson ABW monochrome driver |
| **General** | thestateoftheartprinting | May 20 | An update on the status of inkjet printing |
| | Making your mark | Jul 15 | Signing and embossing of LE Prints |

Visit: **https://thesocieties.net/lockdown-locker/**