Museum photography and Digital Imaging Standards

To assist smaller museums to take better object photographs

Provided by the Victoria and Albert Museum

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1. Introduction

This document is a working tool designed to assist museums in achieving best practice and imaging standards across their object photography. It is a guide and should be used as such

After being asked by several smaller museums to assist them with queries relating to setting up small photographic studios and digitisation projects, I decided to put all of the information in one easy to read and helpful document that could be shared within the cultural heritage sector. I hope the information is helpful, but I understand it may not cover all eventualities. Further options for reading and viewing are listed at the end of the paper.

In this document I hope to cover the following:

- File standards
- Photographing Flat Artworks
- Photographing 3D Objects

1.1. File Standards

All image files should comply with the following standards where possible.

1.1.1. Bit Depth

Bit depth should be set to a minimum of 8 bits per channel. At the V&A we archive our image files at 16 bits (no compression). For those museums with smaller server space or cloud storage 8 bit, LZW compression allows for enough information to be retained to ensure images can be reproduced to publication standard.

1.1.2. Colour space

Colour space should be set on all capturing devices and editing software. Adobe RGB (1998) is generally accepted as the best all round industry standard. We use Adobe RGB (1998) at the V&A.

1.1.3. File Format

RAW: Capture all images on RAW prior to post-production

TIFF: Master files. Always save master files as TIFF files

JPEG: Compressed files for web or on screen use

1.1.4. Resolution

All files should be saved at least 300dpi and at the largest image size possible. This allows for a greater range of uses for the images created. You can always shrink images for on screen viewing as necessary.

1.2. Data Standards

1.2.1. File Numbering

It is up to you to decide on image numbering and file numbering/naming standards. Your individual museum may already have a data standard for file naming. If not, you could adopt a similar standard to one I use at the V&A.

E.g. museum number-001.tif

An object with a museum number of 876-1924 would therefore have the image file name of:

876-1924-001.tif

If more than one image exists of that object, then use subsequent numbers as follows:

876-1924-001.tif

876-1924-002.tif

876-1924-003.tif

If you have a Digital Asset Management System or DAMS, then the system will create unique image numbers for each uploaded file. We do this at the V&A but as good practice I still number my images using the system detailed above.

1.2.2. Metadata

All files should be saved with metadata added. This can be done using programs such as Photoshop, Bridge and Lightroom. Or using for DAMS if you have one.

Metadata should include:

Creator – Photographer's name

Description – brief description of the object taken from the organisations collections management system. A DAMS will pull this information from your collections management system if you have one. If not you can copy and paste and information you have.

Title – Museum inventory number

Credit line – How you want the image to be credited when published

Copyright information - © followed by your organisations copyright info

Copyright status – Check this beforehand. Most images produced by your museum will be copyrighted to your museum.

Rights Usage Terms – This will be available from the person in your organisation that is responsible for copyright and use of images.

2. Choosing a Camera & Software

2.1. Camera

At the V&A we use Phase One cameras and CaptureOne software to produce images of 500mb size. I understand this is beyond the reach of smaller museums, mainly due to budget constraints.

It is possible to photograph publication quality images on DSLR cameras from manufacturers such as Canon, Nikon, Fujifilm and Pentax. Aim to purchase a camera of at least 25 megapixel and a full frame chip. You will also need to get a good quality standard lens 50mm as well as a longer 50-100mm macro lens. You need to ensure the lenses you buy are macro to allow you to focus close up for detail shots. It is also worth investing in a wider lens of around 24mm for photographing larger objects. Again, photographic retailers will be able to advise you on your options for your budget.

2.2. Software

I would advise purchasing camera operating software like Capture One Pro. This allows you to shoot all of your images tethered to a laptop. By tethering your camera to a laptop, you can view your images much larger than on the back of the camera screen, alter exposures and compare shots using different lighting. Capture One also allows you to edit and retouch your photos, control the colour, use masks and organise your workflow. It is a valuable tool to increasing productivity and although it takes a few tutorials to learn it is easy to use and has lots of benefits.

2.3. Tripod, Studio Stand and Copy Stand

In order to photograph 3D objects, you will need to purchase a tripod which is sturdy enough to hold your camera and lens. It is important to invest in this equipment for safety reasons too.

At the V&A we use studio stands rather than tripods for our 3D object photography. These are very sturdy and can be wheeled around the studio with relative ease. They are expensive and require a solid flat floor to support them but can sometimes be sourced second hand to cut costs.

When we photograph flat art works, we use a copy stand to hold the camera parallel to the artwork/painting/poster etc. This is the most stable option and the safest for the objects placed underneath the camera. Copy stands of varying sizes can be purchased. Try to buy the largest one you can, and bear in mind that a wider lens will allow you to photograph larger objects on the stand. You can extend the size of the base board by lying another board on top.

3. Photographing Flat Artworks

This Chapter covers all aspects of photographing flat artworks, including paper, posters, documents, flat fabrics, negatives and transparencies using a digital camera.

It is recommended that non-translucent documents (prints, poster, fabric samples etc.) be captured using a digital camera to increase speed of workflow and minimise damage caused by flattening of objects in a scanner.

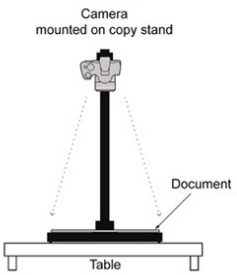
3.1. Procedure for Flat Copy Photography

Here is a simple to follow video on YouTube that shows how to set up your camera and lights for flat copy work.

https://tinyurl.com/n3awd74b

3.1.1. Camera Angle

Keep the camera parallel to the object. Use a spirit level to ensure the camera remains parallel, ensuring maximum sharpness and minimal distortion.



3.1.2. Framing

Place your document on a white, black or mid grey background and keep a border around the object. This shows the whole object has been captured and no cropping has occurred.

9024

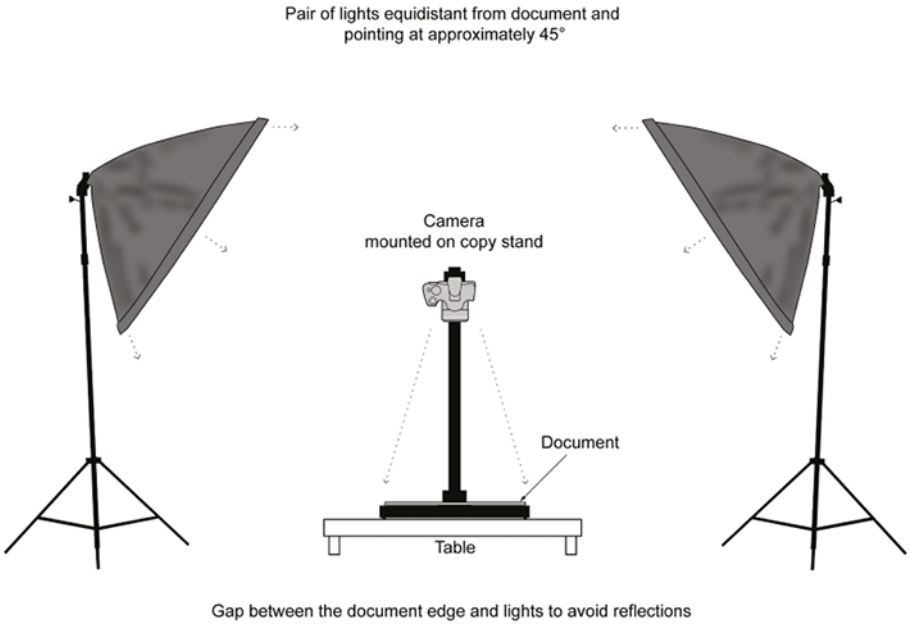
Organise your objects in order of size to minimize time spent adjusting camera position and re-framing.

3.1.3. Aperture

Chose an aperture that allows for best image quality and provides least sharpness fall off. As a rule of thumb an aperture midway between widest and smallest is a good place to start.

3.1.4. Lighting

Position two flash heads with softboxes equal distances from the object. Raise and tilt the flash heads into mirroring positions to allow the light to hit the document at an angle of 30-45 degrees.



If an object has a large deep frame, shiny paint, relief or reflective surface you will need to adjust your lighting position, use flags/reflectors and position card with a hole cut for the lens in front of the camera to limit these as much as possible. You can also bounce your lighting off the ceiling. In some cases, multiple exposures will need to be taken and stitched together later in Photoshop.

If you need to photograph translucent material, e.g., transparencies or negatives, you should position the material on a lightbox and adjust light levels until you get the exposure you require.

Photography is an essential tool for any project within the cultural heritage sector. It has been a principle medium for the recording of museum objects since the middle of the 19th century. It continues to play a greater and greater role within museums and is used to provide online visual content and allows for off-site research.

To produce this image, I took several exposures for the different elements and planes of focus then stitched them together in Photoshop.

T.31-1932

If you are photographing an object with a groove/book spine/raised area then ensure the object is positioned so as not to cause a shadow on your object, i.e. 90 degrees to the light source. In the example below the lights have been positioned to shine in the direction of the arrows.

3.1.5. Exposure

Always use an X-Rite Colour checker to ensure correct exposure of your image. The colour checker should be positioned in the frame but not obscuring the object. You should allow enough space around the colour checker that it can easily be cropped out at a later date by the image user. You won't need to show the whole colour checker in the shot just the section detailed below.

When lighting your object, you should ensure that the following results are achieved:

Black: 25 to 45

White 225 to 245

Mid grey 127-128.

Measure mid grey on the colour checker square marked 

3.1.6. Details

Details of specifically requested sections should be taken using the same techniques as previously listed. Use extension tubes or macro lenses in order to retain sharpness in the image. These details are valuable for researchers, conservators and publishers who may want to see specific areas of text/painting/engraving/signature/maker's mark etc.

When photographing this Chinese textile, I shot the front and the back to show how the object was made. I also shot a detail of Mao Zedong's face along with the Hanzi

FE.278-2020

4. Photographing 3D Objects

This section covers the steps taken when producing photographs of 3D objects from your collection. It is important to include and image of the whole object from various angles as well detail shots if time allows.

The image should be clear, against a plain coloured background – at the V&A we use white, black and mid grey background. By using a variety of lighting techniques, we can also produce graduated backgrounds.

PROV.9851-2016

PROV.1908-2020

As you can see from these bicycles above. The choice of background needs to be sympathetic to the subject colour and material.

While this document can not be a comprehensive guide to photographing every object in your museum it can give a general guide to producing better photographs of 3D objects.

4.1. Angles, Views and Details

4.1.1. Angles

Always ensure you capture one image of the whole object, shot from the front at an angle of 30-45 degrees and slightly elevated. If you only have the capacity to shoot one or two images of each object, this view will tell your audience the most about an object. Frame your object either landscape or portrait depending on the dimensions of the object. Allow some background around the image but be mindful of filling the frame as much as possible. If an object has moveable separate parts, ensure these are visible or even removed from the object and displayed beside. Your image should tell a story about the object and its function.

RPS.3309-2018

4.1.2. Views

If you can shoot more than one view or angle of an object. This removes the need for future object handling and saves time later. Often clients want to see the back or inside of an object, especially for research and publishing purposes. Ensure your lighting is sympathetic to your angle, if you shoot the back of an object you may need to reverse your lighting set up to produce the best quality image. If the image is to be published it is a good idea to know whether an image will be on a left-hand or right-hand page. Will it be printed portrait or landscape? If you aren't sure then you could make sure you allow enough background space around an object that a designer can crop as necessary.



T.259-1926

4.1.3. Details.

Always include detail views if you can. These are valuable to your museum as they give the viewer a chance to see an object up close. This can take the form of stitching, embroidery or buttons on textiles, stones or clasps on jewellery, keys or strings on a musical instrument or a maker's mark. The list of options is extensive, but I tend to go for if it looks important or interesting – shoot it! Details will fill the frame. Make sure you use a macro lens to ensure a sharp image.

4.2. Aperture and Focus Stacking

4.2.1. Aperture

Always choose an aperture at least 2 to 3 stops below the maximum aperture. This allows you to obtain maximum depth of field without compromising image quality.

4.2.2. Focus Stacking

If time allows shoot the set up at a range of focus planes from sharp at the very front of an object to the very back. These images can then be stacked using the Photoshop focus stacking tool. Ensure there is no change to camera or lighting position when shooting for focus stack. If the camera is moved the the stack will not work.

4.2.3. Lighting and Exposure

The first view must be lit to separate the object from the background. As a general rule always use at least 2 lights to model the object, most objects can be shot using three lights, one on the background and one on each side of the object. At the V&A we use Broncolor flash and power packs but any free-standing flash head set up with spill kills, softboxes, honeycomb diffusers and, or umbrellas will work. Make sure you use reflectors, masks and mirrors to bounce light onto your object too.

Here is an example of a set-up I used to photograph silk flowers.

FE.29-2021

It is difficult to advise on what flash and lighting equipment to purchase as this very much depends on individual museum budgets. At time of writing, a small two head Elinchrom portable flash kit can be purchased for around £550.00. Broncolor are around £3,000.00 for a two head kit and there are many more on the market. Most photographic retailers will be happy to advise on which kit to buy depending on use and budget.

You can use reflectors and Photoshop to highlight areas of your object and separate them from the background.

Valuable tools in the studio photographer's kit include reflectors made from white, grey or black card and mirrors. These can be used to bounce light back onto a subject or create a shadow when a light is too strong. Light modifiers and diffusers can also be used to add information about the surface of an object and the material from which it is made.

When you are happy with your lighting shoot an image with the X-Rite colour checker in place as close to the object as possible. This is for reference later. Then remove the colour checker, keeping everything the same and shoot your final image.

When measuring the light falling on an object use the X-Rite colour checker and aim for values of:

Black	25 to 45	White	225 to 245

5. Hints and Tips for Object Photography

Use white card to bounce light back onto a subject if shooting on a dark background and use black card to ensure crisp edges on objects shot on a white background. Take two images, one with the card and one without and then stack in layers in Photoshop.

While the following techniques are well documented online and covered extensively in You Tube tutorials do bear in mind that a technique that works for eCommerce photography may be dangerous and not advised for use with museum objects. You must ALWAYS ensure your objects are safely positioned for photography.

5.1. Shiny Surfaces

I found a good tutorial on YouTube which explains the theory of:

The angle of incidence = the angle of reflection

This concept will help you understand how best to photography shiny metal objects and produce better object photography for your museum.

https://tinyurl.com/5s7epcb4

When photographing a shiny surface start by setting up your lighting using softboxes or umbrellas. This will diffuse the light and remove the harshness of light onto the shiny surface. You will need to move the lights around your object and use flags and reflectors to limit hot spots on the surface and keep as much detail as possible. In some cases, as with the image below, I constructed a light tent from white paper and then used Photoshop to retouch out the camera lens and light stands.

CIRC.279-1961

CIRC.279A-1961

CIRC.279B-1961

T.291-2019 & MISC.58-1979

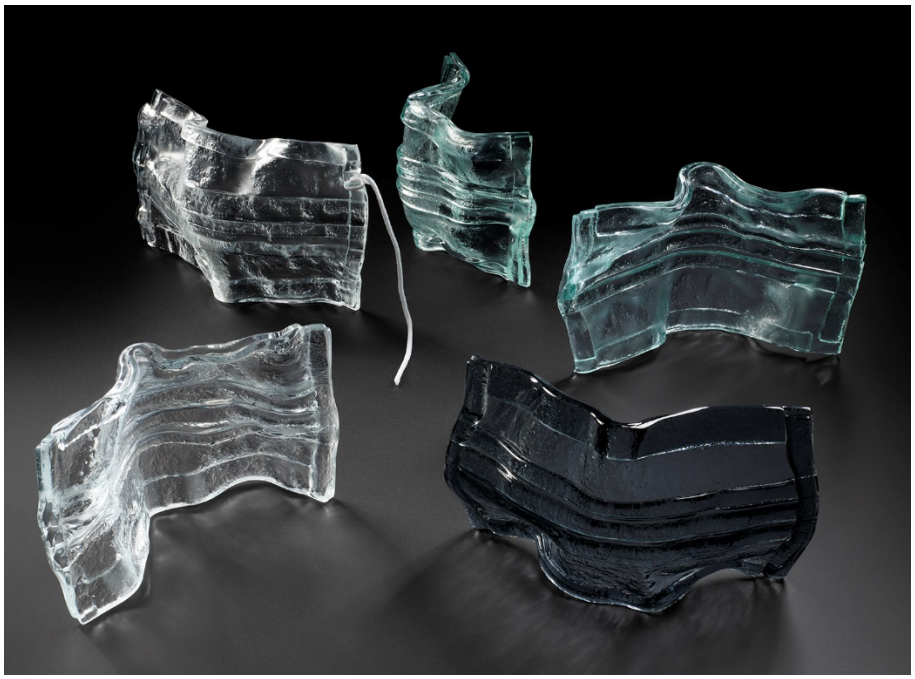
5.2. Glass

When photographing glass always use a black or dark grey card close to the edge of the glass to ensure edges don't disappear into the background. There are many tutorials online that will take you step by step on how to photograph glass, I suggest spending some time watching these then practicing in the studio until you find what works for you.

4489-1901 C.6-1911

The following tutorial will help explain a few basics of glass photography:

https://tinyurl.com/uvxs94jd



ME.7-2021;ME.8-2021;ME.9-2021;ME.10-2021;ME.11-2021

5.3. Jewellery

Jewellery can prove tricky to photograph as it is often very delicate, shiny and lifeless unless positioned correctly for photography. At the V&A we often photograph jewellery on a mannequin or use white or black backgrounds and spot lighting to bring the piece to life. Over-use of softboxes can often kill the sparkle in jewellery so this type of photography can be tricky to master.

ME.27-2019

M.6:1-2007

5.4. Textiles & Costume

At the V&A we photograph costume and clothing on mannequins. For us this gives the best image of the object – it can be seen as it would have been worn. We are lucky at the V&A that we have the luxury of a dedicated team of textile

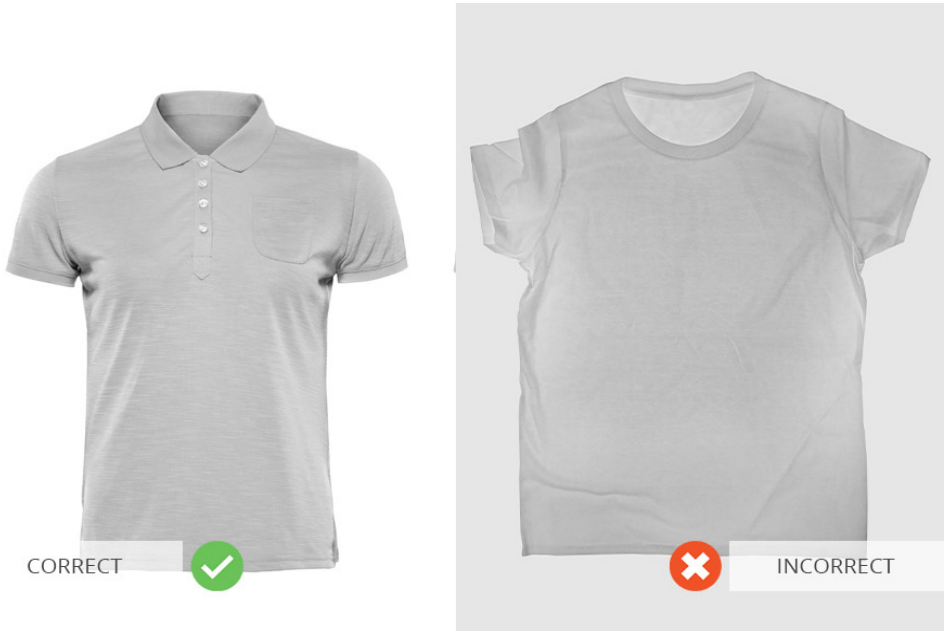
conservators and costume mounters who dress the mannequins for us. It is advised, where possible, that you shoot costume mounted on a mannequin.

T.89-2018

S.199-2018

Always capture a full-length front view, a ¾ full length view, a full-length back view and details, concentrating on the construction of the costume, embroidery, fastenings, pattern and weave.

If it is not possible to mount the costume on a mannequin, try to shoot it flat using a copy stand. Pad the garment slightly with tissue paper puffs to give it a 3D appearance.



Hats should always be photographed positioned on a mannequin head or Perspex hat stand. These can be purchased relatively cheaply from a shop fitting retailer. Make sure you have at least two sizes of head if you have a lot of hats in your collection as they won't all be the same size. Make sure you shoot a front shot, a ¾ shot and the back. It is also good practice to take a photograph of the inside of the hat, you can do this on the flat copy set up but do ensure you bounce the lights off the ceiling to avoid harsh interior shadows.

487-1874 T.109-1964 FE.183-1995