

1. Introduction to the darkroom

The oldest surviving photograph was taken by Joseph Nicéphore Niépce in 1826 or 1827. The print was made on pewter with a solution of Bitumen of Judea. The exposure time on this photograph was around 8 hours.

In 1817 Richard Leach Maddox invented the first silver gelatin coated paper for photographic paper. Until then, all photographic prints had to be contact printed. Silver gelatin prints responded well to artificial light. Whilst details are sketchy, indications are that horizontal enlargers were available in around 1886 with upright enlargers as we know them today being used from around 1921.

Whilst the chemicals that we use in the modern darkroom are relatively safe, it is essential to follow the health and safety protocols for a safe darkroom experience. You will find that most of the general instructions are clearly visible in each work area.

The darkroom is divided into two main areas: a dry area and a wet area. The dry area is used for working with paper and materials prior to development. It includes the dry bench, the enlargers and cubicles, the RC print dryer and printing equipment storage. The wet area comprises the wet bench (where the chemical trays are), the storage shelves above the wet bench, and the drying lines above the wet bench. It is important not to bring any wet bench items into the dry area as any water or chemistry can damage any unexposed paper and/or equipment. The one exception to this rule is the RC Print Dryer. Before using this machine (positioned in cubicle 5), ensure that your print has been thoroughly rinsed and excess water has been shaken off or squeegeed. No water should be allowed to drip onto the darkroom floor or benches.

In our darkroom at Tashkeel, we have 4 Durst M601 VC black and white enlargers. The basic process for making a photographic print is:

1. The developed negative is placed in the enlarger's negative holder.
2. The negative is focused by using a film grain magnifier.
3. A test strip is made to determine the correct exposure.
4. The final print is made with the determined exposure.
5. The print is developed in the developer tray.
6. The print is washed in the stop bath.
7. The print is fixed in the fixer tray.
8. The print is washed under running water.
9. The print is dried either by hanging on the drying line or in the RC dryer (Resin Coated prints only).

2. Procedure on entry to the darkroom

The darkroom at Tashkeel is a shared space with numerous users making use of the facility. As such it is important to observe certain protocols to ensure that the experience is both safe and enjoyable for all users of the darkroom.

2.1 Lights

Before entering the darkroom, check to see if the "darkroom in use" sign is displayed. Knock on the light sealed access door before switching on the light or entering. If the darkroom is in use, only enter once the user agrees that it is safe to do.

Once in the darkroom, ensure that any unexposed paper is properly stored prior to switching on main lights after being under safelight conditions.

2.2 Inventory Control

On entering the darkroom, each user must conduct a quick inventory control making use of the supplied darkroom inventory form **. All darkroom stock locations are clearly marked and this procedure should take no longer than 5 minutes. Any discrepancies should be recorded both on the stock sheet and the darkroom incident form. If you have filled in a darkroom incident form, please remember to hand this in at reception when you leave.

** For group workshops, etc., this only needs to be done by one person.

2.3 Cleanliness

If the darkroom is not clean and up to standard when you enter, please record this on the inventory form.

2.4 Ventilation and air-conditioning

Ensure that the extraction fans are operating prior to mixing or dispensing chemistry. The switch is on the back wall of cubicle 1. The air-conditioning unit should be operating when you enter the darkroom. The temperature should be set at 24 degrees (see procedure on exit). The ideal operating temperature setting when the darkroom is in use is between 20 and 22 degrees Celsius. Set the temperature using the remote control mounted to a bracket on the rear wall between cubicles 2 and 3. **The air-conditioning unit should never be turned off.**

3. Health and Safety in the Darkroom at Tashkeel

The darkroom at Tashkeel has been designed to be a safe environment. It is essential that all users follow the procedures set out in this manual to make their darkroom experience both safe and enjoyable.

3.1 Protective clothing

The following protective clothing is provided:

- Protective glasses (Compulsory when mixing chemicals).
- Disposable gloves (Compulsory when mixing chemicals. Recommended when processing prints in the trays).
- Lab coats (Compulsory when mixing chemicals. Recommended at all times).

Potential hazards in the Darkroom

3.2 Electrical Hazards

We use various electrical appliances in the Darkroom at Tashkeel. Other than the ceiling mounted safelights and ventilation system, these are all located in the dry area in the vicinity of the enlarger cubicles.

- It is essential that no liquids be used, stored or transported to or in this area.
- Take care when setting up enlargers or placing any items in the enlarger cubicles.
- Ensure that no items are placed on electrical cables.
- Ensure that any switches are switched off at the wall unless an item of equipment is in use.
- Do not pull on any electrical cables.

Should you notice any problems with any electrical equipment, advise the health and safety officer and/or the darkroom custodian and record the fault on a darkroom incident form.

Should there be a short circuit or exposed wires, turn off the power at the wall if safe to do so and immediately advise the health and safety officer and/or the darkroom custodian.

3.3 Chemical Hazards

Whilst the chemicals that we use in the Darkroom at Tashkeel are generally regarded as non-hazardous if used correctly, there are nevertheless important guidelines that need to be followed when using or mixing chemicals. Some of the chemicals can irritate the eyes, skin or respiratory system both in raw and diluted form.

UNDER NO CIRCUMSTANCES SHOULD FOOD, DRINK OR CIGARETTES BE CONSUMED IN THE DARKROOM.

This is not only for reasons of hygiene, but chemicals could contaminate these items rendering consumption potentially unsafe.

When mixing chemicals the following protective gear must be worn:

- Lab Coat
- Disposable Gloves
- Eye Protection

Always follow the manufacturer's instructions when mixing chemistry.

Remember to always add chemicals to water – NOT water to chemicals! Ensure that all mixing equipment, beakers, jugs and trays are clean before use. Once you have completed mixing chemistry, immediately clean all containers and equipment used with water and place on the sink to dry. **Detergents should never be used to clean darkroom mixing apparatus.**

When processing paper in the chemical trays, always use the tongs provided. Disposable gloves are also provided should you wish to use them in addition to the tongs.

In the event of a chemical spill, any spilled chemicals are to be immediately cleaned up by using the chemical spill kit. *The following protective gear must be worn: Lab coat, gloves and safety goggles.* Any affected areas should be thoroughly cleaned with tap water and dried. Do not use paper towels to clean up chemicals as chemical reactions may cause fires.

The Safety Data Sheets (SDS) for chemicals in stock at Tashkeel are included in this file. Please familiarize yourself with the potential hazards and health risks (if any) of the chemicals that you will be using.

At the end of each session, the chemical trays containing used developer and fixer should be emptied down the drain together with plenty of running water. The tray containing indicator stop bath should be poured into the labeled container for stop bath providing it is still coloured yellow. Should the stop bath be coloured purple/ indigo, it is exhausted and should be disposed of in a

similar fashion to the developer and fixer. **It is essential that all chemicals disposed of should be flushed down the drain with plenty of water.**

Should chemicals come into contact with skin, eyes or mouth, flush immediately with plenty of water and refer to safety data sheets for the chemical to determine further action.

3.4 Slipping Hazard

The floor in the darkroom is tiled and could pose a slipping hazard if wet. Ensure that the floor remains dry at all times. Any water or chemical spillage needs to be cleaned immediately before commencing/ continuing work.

3.5 Revolving Door

The revolving door poses a potential hazard inasmuch as fingers or limbs could become trapped in the mechanism. Ensure that when using the door, all limbs are kept away from the mechanism. Before using the door, ensure that there is not another user in the process of entering or leaving the darkroom. This can be done by simply knocking on the door and calling out.

3.6 First Aid Kit, Chemical Spill Kit and Fire Extinguisher

In the event of an injury in the darkroom, keep the injured person calm and still. The first aid kit is available on the wall next to the revolving door. In the event of contact with chemicals, flush the affected area thoroughly with water and remove any contaminated clothing – make use of the lab coats provided to preserve modesty. Any injuries / chemical contact should be reported to the health and safety officer on duty immediately. Once the situation has been resolved, the incident, including full details of those involved, should be recorded on the darkroom incident register.

In the event of a chemical spill, any spilled chemicals are to be immediately cleaned up by using the chemical spill kit. Any affected areas should be thoroughly cleaned with tap water.

The fire extinguisher is located next to the revolving door just inside the darkroom. Please familiarise yourself with its safe operation according to the supplier's instructions printed on the extinguisher. None of the chemicals used in the Tashkeel darkroom pose specific fire hazards and any fires should be treated according to the flammability of the surrounding area.

3.7 Evacuation Plan

Should it be necessary to evacuate the darkroom in event of a fire or other emergency, all users are to exit through the revolving door in an orderly fashion. Any ladies are to be given priority. No more than one person should enter the revolving door at a time. Proceed to the assembly area in the garden through the Design Centre door. Any instructions from the health and safety officer should be followed in any emergency.

4. Equipment List

The following list is a complete inventory of all items in the Darkroom at Tashkeel. Any discrepancies should be recorded on the inventory control register and should be brought to the darkroom custodian's attention.

ITEM	ON HAND
Thermometer	2
Film/ Paper Clips	12
Measuring Jugs 1L	6
Measuring Jugs 2L	1
Glass Chemical Bottles 1L	4
Plastic Concertina Bottles	3
Small Funnel	1
<i>Tongs</i>	
White	2
Red	3
Blue	3
Stainless	3
Dark Bags	1
Developing Tanks 2 reel	6
Developing Tanks 3 reel	1
Developing tanks 5 reel	
Developing Tanks large Format	1
Developing Tanks stainless MF	2
Developing Tanks stainless 35mm	
Spare Reels Paterson Tanks	
Spare Reels Stainless Tanks MF	
Guillotines A4	2

Film Squeegee	3
Paper Squeegee 8in	2
Developing Trays A4	1
Developing Trays A3	4
Developing Trays A2	9
Darkroom Timers	1
Enlarger 1 B5920	1
Enlarger 2 B5920	1
Enlarger 3 B5920	1
Enlarger 4 B5920	1
Enlarger 5 B3652	1
Enlarger Timers	5
Safelights Portable	5
Film Grain Magnifiers	4
Contact Sheet Printer 35mm	5
Contact sheet Printer Blank	2
<i>Masks For Enlargers</i>	
35mm	5
6x6	2
6x7	3
Glass Universal	3
Diffusers	5
Lenses	
50mm	5
75mm	

80mm	1
100mm	1
Lens Holder Base	1
Darkroom Easel 10x12	4
Darkroom Easel 14x18	5
Enlarger Covers	4
Scissors	8
Pliers	2

5. Mixing Chemistry

The mixing of chemistry is the most hazardous part of working in the Darkroom. Please follow all instructions to the letter.

- READ the manufacturer's SDS to familiarise yourself with the potential hazards.
- Protective clothing **MUST** be worn (lab coat, disposable gloves and safety goggles).
- Use the measuring jugs provided for mixing chemicals. Please note that they are labeled. Only use the jugs labeled for the chemical that you are mixing in order to prevent cross contamination.
- Mix the chemicals according to the manufacturer's instructions (printed on the container and listed in this manual).
- Clean any spills thoroughly with water – use the spill kit if needed.
- Replace caps on bottles of stock product and return them to their appointed storage spot.
- Rinse all apparatus used for mixing thoroughly with tap water. Place them on the rear edge of the wet bench to dry and replace them on the shelf at the end of your session.
- Should you use the last of any chemical stock, record this on the inventory register under comments and advise the darkroom custodian who will arrange for the stock to be replenished.

6. Developing Film

The development of photographic film occurs in complete darkness. To facilitate this total blackout, a darkbag is used where the loading of film into the developing tank takes place. Loading of film can be done either on the dry bench or in cubicle 5. If you are new to loading film, it is suggested that you use a test roll to practice in full light conditions before you attempt loading film in the darkbag. The basic procedure for developing film is as follows:

- If you have film extraction tape, you can extract the leader on 35mm film prior to putting it in the dark bag. With scissors, clip the film straight and bevel the corners.
- Place the developing tank, scissors, film canister opener and film in the darkbag.
- Close both zippers.
- Put arms through the sleeves taking care to ensure that there are no gaps between the elasticized sleeves and your arms.
- If you are developing 35mm film, use the film canister opener to open one end of the canister and pull out the film on its spool. Do not unwind the film at this stage. Carefully cut the corners of the film with the scissors. You should only cut around 1mm off of each corner of the leading edge.
- If you are developing medium format film, break the seal on the film with a fingernail or the tip of the scissors. Pull the protective paper with your right hand whilst holding the spool with your left hand. Allow the paper to run between your thumb and forefinger. At some point you will feel the end of the film press up against your finger. Carefully cut the corners of the film with the scissors. You should only cut approximately 1mm off of each corner of the leading edge.
- Take care not to touch the film on the flat surface, always hold the film on the edges OR on the very tip of the flat surfaces. Fingerprints on the emulsion will damage the film.
- Do not let go of the film as locating the end in the darkbag can be problematic.
- Carefully load the leading edge of the film into the plastic spool of the developing tank. Ensure that the film has engaged with the small ball bearings.
- Gently twist the spool backwards and forwards to continue loading the film.
- Once the film has been successfully loaded, place the spool on the spindle, making sure that it is right at the bottom of the spindle. Put it into the tank and close the

light sealed lid by gently twisting it clockwise. A definite click will be heard when the tank is correctly sealed.

- Open the dark bag and **move to the wet area**. Proceed with development as per the chemical manufacturer's instructions.

The general order for processing of black and white film is as follows:

1. Developer for specified time.
2. Stop bath for specified time.
3. Rinse for 5 minutes.
4. Fixer for specified time.
5. Rinse for 20 minutes under running water.
6. Final rinse with wetting agent for 5 minutes.
7. Remove film from tank and allow to dry.
8. Thoroughly rinse developing tank and spools and allow to dry.

The secret to successful film developing is to be consistent. Get into the habit of always following the same procedure. Preferences in agitation methods vary. Use whichever method works for you and stick to it. Remember to gently tap the tank on the edge of the wet bench to release any air bubbles caught in the film spools.

Remember that all developing must take place at the wet bench.

7. Making a test strip

To establish the correct exposure for your final print, you will need to print a test strip. The basic procedure is:

- Place the negative that you wish to print from in the negative holder of the enlarger. Make sure that you have the correct lens and mask configuration for the negative size that you are going to print.
- Adjust the Easel according to the size of paper that you are going to print on. Remember to allow for the borders.
- Set the lens to its widest aperture.
- Adjust the height of the enlarger head according to the print size that you require. Remember that print size is also affected by focus so use both height adjustment and focus to set print size.
- Once the projected negative is the correct size on the Easel and in focus to your eye, use the film grain magnifier to fine focus on the grain structure of the negative.
- Set the lens to a medium aperture like f8 or f11.
- Set the contrast on the enlarger to 2 or 2.5.
- Cut a strip approximately 40-50mm wide from a sheet of the paper stock that you are going to print on. It is a good idea to cut one sheet up completely into test strips. Remember to place whatever you're not using back into the light sealed box/ sleeve before you start printing. Use the dry bench for paper cutting and preparation – not the cubicles.
- Select a piece of black card slightly larger than the test strip that you have cut.
- With the enlarger turned off or with the red filter in place, place your test strip on the Easel in an area that you wish to determine exposure. It is normally best to use an area of main focus in the composition. Make sure that the test strip is secure so that it does not move during exposure.
- Turn the enlarger lamp off if you are using the red filter and move the filter away.
- Set the timer to a round figure exposure. Remember that the density of the negative will greatly affect exposure. For an 8x10 print on Ilford Multigrade paper, I would normally start with an exposure of 15 seconds at f8.
- Expose the entire test strip for the set time.

- Change the timer setting to a shorter time. If my first exposure was 15 seconds, I would now set my enlarger timer to 2 seconds. This is a process that you will be able to refine with practice.
- Cover a small part (10-15 mm) of the test strip at either end with the black card.
- Expose.
- Cover a further piece of the test strip (again 10-15mm).
- Expose.
- Continue this cover-and-expose process until only 10-15mm of the test strip is visible from the end of the black card. You are working along the length of the test strip so from the short side so you should have numerous exposures.
- Develop the print in the print trays.
- Squeegee.
- If you are working with RC paper, dry the print in the RC print dryer.
- View the test print in bright light conditions (remembering to take other darkroom users into account☺).
- You now have a test strip to determine your exposure for your print. The lightest block will be the initial exposure. Each block further along the strip will reflect the extra exposure. The block closest to the final exposure that you will use will thus be a *sum* of the initial exposure *plus* the *sum* of the *further incremental exposures*.
- Should the test strip be too light or too dark in its entirety, redo the process with a different start exposure. Remember that exposure is always a balance between aperture and time. Also view contrast at this time and adjust the contrast control as required. Changing contrast will also affect exposure so you will need to do another test strip after changing contrast.

The method described above is the simplest way of creating a test strip but is not necessarily the most accurate. Refer to the appendix for notes on f-stop timing which is more accurate, albeit more complex.

8. Making a print

Once you have successfully printed your test strip, you can perform your first print.

Remember that this will probably not be your final print, but rather a test print in order to establish what further work you wish to do in order to express yourself artistically.

Remember that there is no such thing as a perfect print. Each printer will – and should produce a print that is to their specific taste.

The process for producing this test print is simple:

- With the enlarger set up as it was for the test strip, set the aperture, time and contrast as determined by your test strip print.
- Under safelight conditions, place a full sheet of the paper that you are using on the Easel. Remember to lift the black frame completely up before placing the paper on the base of the Easel. Bring the black frame (mask) down, ensuring that the paper is straight and the paper clamps hold the paper. The paper must be held flat by the mask. If it is not, adjust the mask as necessary.
- Perform the exposure making sure that you do not bump the cubicle or enlarger during the exposure.
- Remove the paper from the Easel and develop in the trays in exactly the same way as the test print.
- Once your print is dry, view under bright light conditions and decide on any further adjustments.
- Never remove your developing print from the developing tray before the specified time! It may look too dark under safelight conditions but your print will actually appear lighter in bright light conditions.

REMEMBER: Exposure adjustments are made on the enlarger, not in the developer



This is the very basic method for printing in the darkroom. There are many, many more variables that can be introduced, such as dodging, burning, split grade printing, toning, lith printing and...

9. Process on exit of the darkroom at Tashkeel

1. Ensure that all cubicles are neat and tidy.
2. All enlargers should be set up for 35mm format printing i.e. 35mm mask in the negative holder and 50mm lens installed.
3. All enlargers should be covered.
4. All switches for enlargers, dryer and safelights should be switched off at the wall.
5. Dry bench should be tidy and clean.
6. Darkroom accessory cupboard should be neatly packed and all stock accounted for.
7. Wet bench trays should be emptied and rinsed (refer to health and safety section for disposal of chemicals).
8. All mixing equipment should be stored on the shelf on the wet bench.
9. Wet bench should be clean and tidy.
10. Floor should be clean and tidy.
11. Darkroom stock register is up to date.
12. Any incidents have been reported and incident form has been completed and given to the relevant person if necessary.
13. AC is set at 22 degrees.
14. Negative table and foyer area is clean.
15. Switch lights off.