SP-275 Installation and Operation Manual

RISO SP-275 ScreenFax

RISO

Screen Printing and the RISO Screen System

Screen printing is a method for printing on paper or cloth. A screen made of silk, nylon or stainless steel mesh is attached to a frame. Through one of a variety of methods, sections of the screen are treated so that ink will pass through while other sections prevent ink passage. When ink is pressed against the screen using a flat rubber-ended tool called a squeegee, the desired design is printed.

In the early days of screen printing, the most commonly used screen material was silk, and consequently this technique is often called "silk screen printing". In recent years, however, the most frequently used screen materials have been nylon, polyester, or stainless steel mesh, rather than silk, so this technique is now simply called "screen printing".
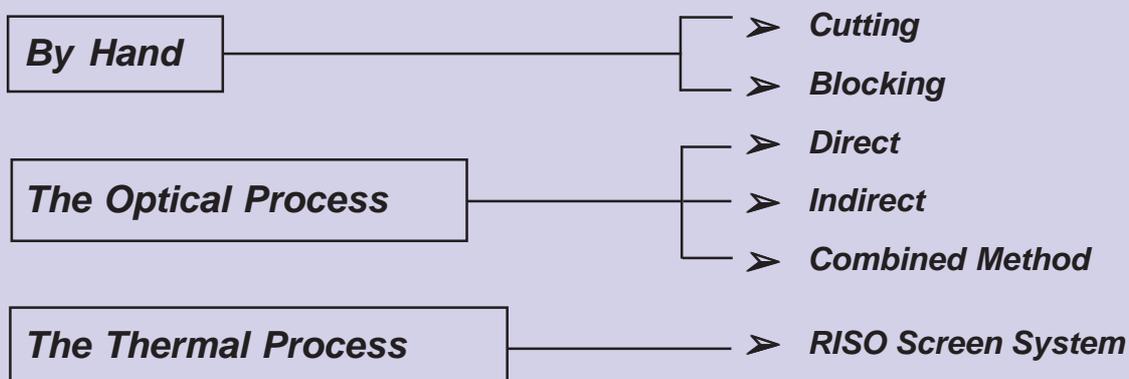
In comparison to other printing methods, screen printing is characterised by its relative simplicity and the wide range of applications that are possible with it. Thanks to its flexibility, its usage had spread to a wide number of different fields.

The RISO Screen System adds to the advantages of screen printing by further simplifying the screen making process – the most difficult step in conventional screen printing. The result is a screen printing system that is fun for anyone to use from absolute beginners to seasoned professionals.

2. Screen Making Methods

There are three basic ways to make a screen: by hand, or by using optical or thermal processes. The RISO Screen uses the thermal process.

By Hand	➤ Cutting
	➤ Blocking
The Optical Process	➤ Direct
	➤ Indirect
	➤ Combined Method
The Thermal Process	➤ RISO Screen System

By Hand

Cutting

Features

Offers very sharp results for simple pictures and lettering.

Procedures

(When using varnished paper)
1) Coat the original with wax, and place it on top of the varnished paper.
2) Cut out the design on the varnished paper with a cutter.
3) Attach the remaining paper to the screen with an iron.

Blocking

Features

Allows for subtle nuances since the design is drawn directly on the screen.

Procedures

(When using paint and sealant)
1) Draw the design directly on the screen with paint
2) Cover the screen with sealant
3) Apply thinner to the paint

The Optical Process

Direct

Features

Since the design is burned directly onto the screen, image sharpness is limited; it is, however a good method for printing large designs or for high-volume printing.

Procedure

1) Prepare a film positive of the design
2) Coat the screen with developing solution
3) Attach the positive to the screen and expose it
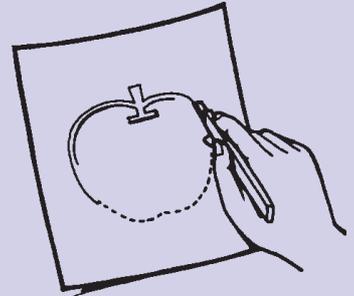4) Develop the image by bathing it in water

Indirect

Features

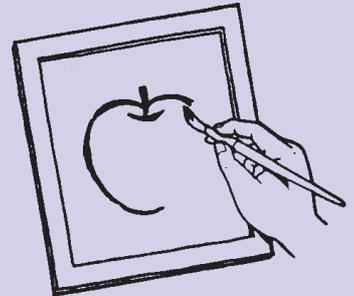Yields a sharper image that the direct method, but the screen is not as durable.

Procedures

1) Prepare a film positive of the design
2) Attach the positive to a developing film and expose it
3) Develop the image by bathing it in water
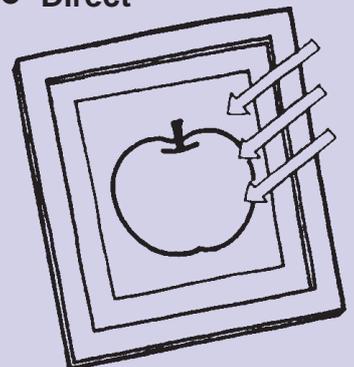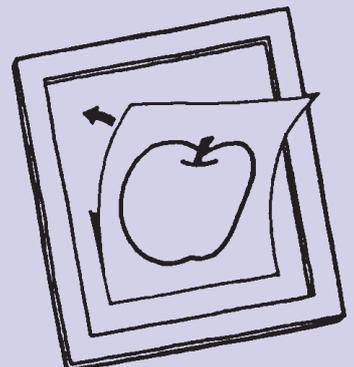4) When development is complete, affix the developed film to the screen

● **Cutting**

● **Blocking**

● **Direct**

● **Indirect**

Combined Method

Features

Combines the screen durability of the direct method and the image sharpness of the indirect method.

Procedures

1) Prepare film positive of the design.
2) Affix developing film to the screen.
3) Attach the film positive ad expose it.
4) Develop by bathing it in water.

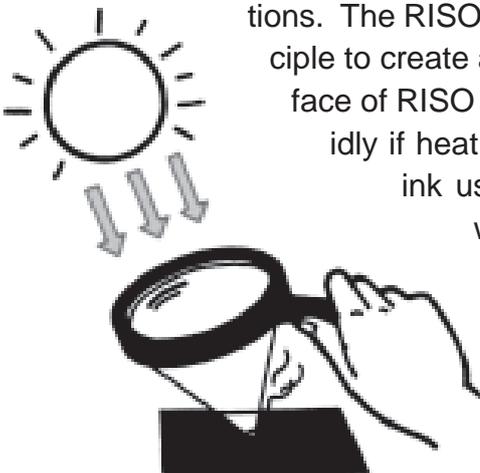# Thermal Process

RISO Screen System

Features

Screen making is quick and easy. Preparing the original is also simple, and there is no need to work with film positives.
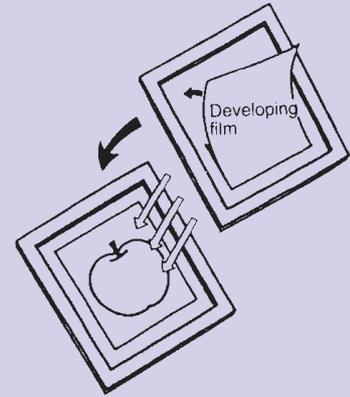
Procedures

1) Draw the design using a carbon-containing writing implement.
2) Lay the design original on the screen and expose it to the flash.
3) Remove the design original.

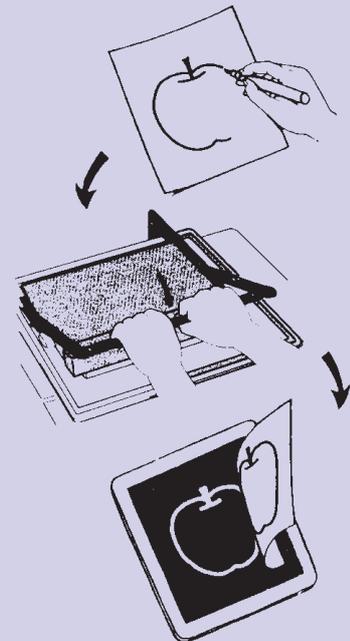> *The principal behind the RISO Screen System*

If you were to draw a design in black on a piece of paper and then focus a strong light on the paper using a magnifying glass, small holes would be burned in the blackened sections. The RISO Screen System uses this principle to create a screen master. The film surface of RISO ScreenMasters will shrink rapidly if heat is applied. The carbon in the ink used to draw the design reacts with the infra-red light in the flash, concentrating the light's heat. Minute holes (which will allow ink to pass when printing) are burned into the screen in a pattern matching the original design.
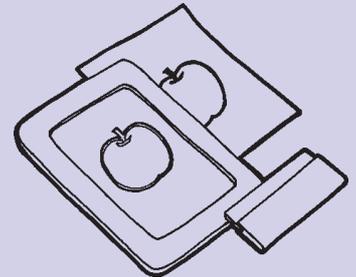
- **Combined Method**

- **RISO Screen System**

Features of RISO ScreenMaster

This is another of RISO's "world first" products – it enables the operator to produce an imaged screen in a few seconds. More important still is the fact that the end result is of "high professional quality".

➤ RISO Screen Master is a lamination of polyester screen mesh and a specially formulated plastic film and as such is ready for instant processing.

➤ No intermediate processing of artwork is required when using RISO Screen Master.
· Simply use RISO Artwork Pens on plain white bond paper then process direct to screen
· Plain paper photocopies and most printing in black from books, magazines etc., can also be used for artwork

➤ Print "READY" Screens in "LESS THAN 5 MINUTES"
· Actual exposure time is "less that one second"
· The processed screen is then attached to a "RISO Quick Mount Frame"
· These frames are "reusable"

➤ Print Quality
· Matches other screen printing systems
· Superior print quality will be achieved using "RISO Squeegees" especially developed for the system

➤ Increasingly used by professionals and amateurs alike
· Screen Printers and Sign-makers
· Schools and Colleges of TAFE
· Government Departments both State and Federal
· Small business and hobbyists in the home
· There is a RISO Screen Master System available to suit most applications

➤ RISO Screen Master caters to a wide variety of applications including:
· Textiles, Signs, Posters
· Plastics, Glass and Ceramic Printing
· Glass Etching, Instrument Panels and Printed Circuit Boards

➤ RISO Screen Master will produce one thousand prints from a single screen and is available in rolls up to a maximum width of 600mm in standard or fine grade mesh. "Starter Kits" are available.

➤ Completely SAFE, DRY and NON-TOXIC.
· No fumes. No odors. No chemicals
· RISO Screen Master removes the 'tedium' from screen printing

➤ It also removes the need for:
Hand cutting stencils, tensioning and stapling screens, coating emulsions and curing time, camera equipment, processing artwork, darkrooms, chemicals and baths, special lighting, compressors, vacuum frames, pressurised water, large quantities of screen frames and working space.

Artwork Types and Preparation

Artwork Requirements

IMPORTANT: Artwork for use in RISO systems **MUST** be carbon based.

➤ Paper must be non-glossy, high or medium grade

➤ Coated papers such as art paper may not be used

➤ Writing instruments must contain carbon.

➤ Original must be thoroughly dried before printing. A damp original may cause a defective screen/ poor printing results

Points to remember while preparing artwork

Artwork can come in many different forms/ types, with each containing a different levels of carbon. Therefore each type must be prepared accordingly to provide optimum results.

➤ A computer and laser printer should be used where possible as this method provides the maximum quality of original artwork

➤ Keep the area where you will be preparing the original clean

➤ Dust and cigarette ash will spoil the original. Do not smoke when preparing the original because ashes contain carbon and they will therefore show up when the screen is imaged

➤ If you intend to save the original for a period of time before making the screen, keep it in an envelope to protect it form dust

Choosing the size of the original

The size of the original is ONLY limited by the size of the ScreenMaster mesh you will be using NOT the screen-making component's stage (i.e., the exposure area), as multiple flashes can be made for the one design.

You should take into consideration the screen frame and the area where ink will build up when calculating the size needed.

Artwork types

There are 4 main types of carbon artwork you can use:

1/ **Hand drawn** with RISO Carbon Artwork Pens

2/ **Photocopied designs** - combining different artwork types

3/ **Laser Prints** from a computer (not bubble/ ink jet)

4/ **RISO Artwork Books** - off set printed with carbon ink

- The quality of your print depends upon the quality of your artwork

- Two minutes spent preparing your artwork can save you 20 minutes in screen/ printing problems

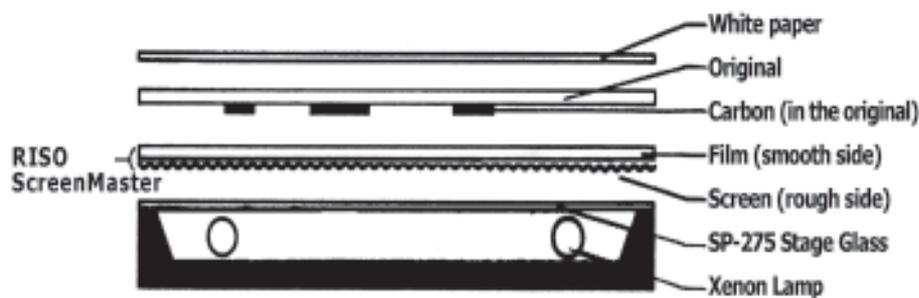- The complete SP-275 Operation Manual details each of the 4 types of artwork including preparation.

- Screen cutting settings and summary are listed for each in the Full operation manual.
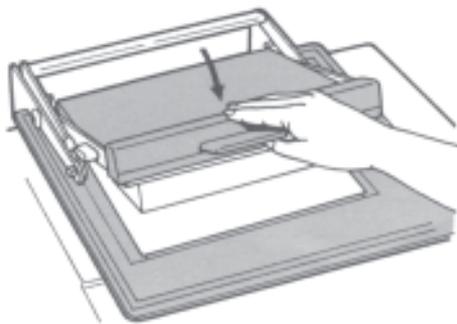
Imaging RISO ScreenMaster with SP-275

Making a screen with SP-275

The xenon lamp flash interacts with carbon in the original to create heat, imprinting the screen by opening minute holes in the film surface (on the screen's smooth side).

1. Prepare your RISO ScreenMaster for imaging, if required, by cutting to suite the size of the frame required
   ~ The screen should cover all the taped area around the frame

2. Place face down over the SP-275 Stage Glass, in the order as pictured below

- RISO Screen Master 135 mesh is sometimes a little difficult to tell by feel alone.
- Hold the mesh and inspect both sides. The Matt finish side of the Screen Master is the mesh side.

3. After placing into the machine, cover with a piece of plain white paper to mask the background

- If the covering pad is dirty, smudges and unwanted marks will be imprinted.
- Placing a white piece of paper over the original will prevent smudging and unwanted marks from being transmitted to the screen during imaging.

4. Lower the Lid of the machine

5. Set the sensitivity adjustment to the correct setting as determined by the artwork type you are using (previously outlined **Artwork Types and Preparation**)
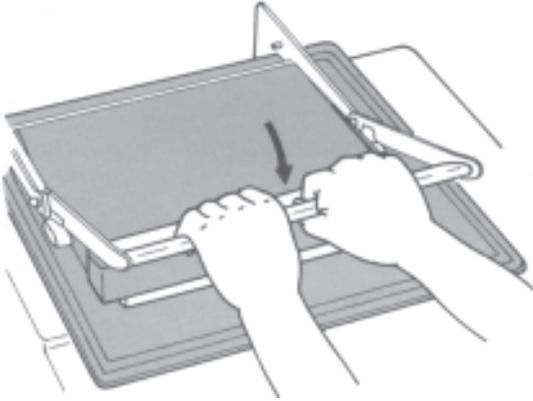
- On humid days, or when the original has thick letters or large blocks of shading, set the sensitivity a little higher than usual.

➢ Remember each form of artwork contains a different level of carbon and will require a different setting. If you are unsure of the setting, perform a small test first to determine a suitable setting for your artwork.

6. Switch the selector switch up or down to the setting (PPC or NON- PPC) to begin powering up the machine.

7. When the electrical charging process is complete, the green light will flash and an audible click will begin. Push the handle down to 'flash' the machine - This completes the screen imaging process.

8. Before removing the original from the screen, peel back a small corner of the design to check that the imaging is complete.

When do I increase the setting?

~ General rule is that when 80% or more of the sdesign HAS been imaged - keep the setting at the same level.
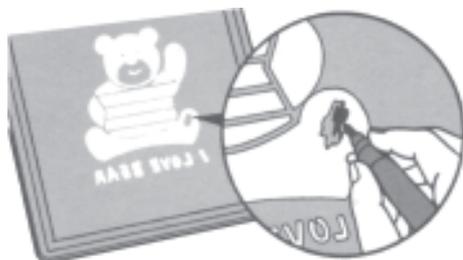
~ If less than 80% has been imaged increase the setting by 0.5-1

NEVER increase by more than 1 in NON-PPC range (no matter how tempting)

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9. Peel the original off the screen.

10. Check to see that the glossy film has been completely removed from the design areas.

➤ If you have not imaged the design correctly and film sections remain, write over them with a RISO Pen (as shown below), lower the sensitivity setting and expose the screen one more time.

Final Clean-Up

After you have removed your original from the screen you can perform the following clean-up procedure to remove any excess carbon deposits remaining in the mesh.

1. Place the screen on the glass stage, rough side down
2. Cover with a piece of Artwork Clean-up Paper (Code S-155).
3. Set the machine to a setting of 5 PPC and 'flash' the screen against the Artwork Clean-up Paper.
4. Remove and discard the Artwork Clean-up Paper.

- Imaging is complete if no glossy spots remain in the areas on which the design is drawn.

- If shiny areas can still be seen when examining the screen from the rough side, the screen is not completely imaged.

- Increase the sensitivity setting slightly and expose the screen again.

- If the light sensitivity setting is too high, there is the danger of a large hole being burned in the screen.

- This process will remove traces of carbon, which remain in the screen mesh.

- It will prevent that 'blotchy' appearance of your first test prints.
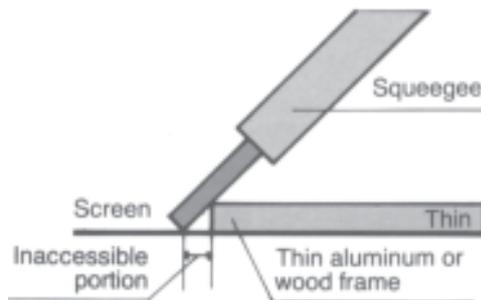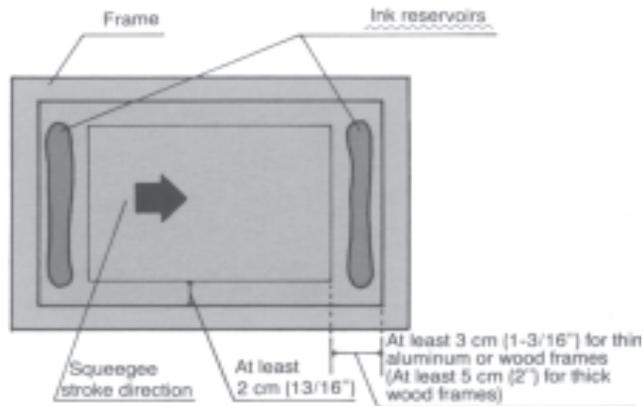
- It will make the set-up and test printing easier.

- Plain white paper can also be used
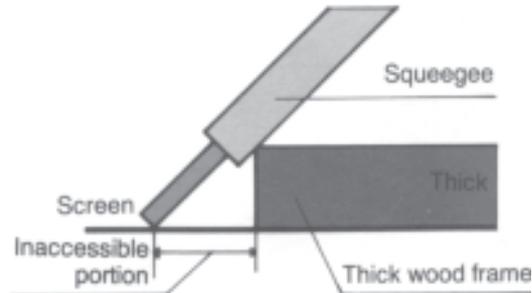
Framing the RISO ScreenMaster

Positioning the ink reservoirs

When deciding the size of your frame, it is necessary to correctly position ink reservoirs (areas at the beginning and end of the squeegee stroke where ink will collect).

Frame | Ink reservoirs

Squeegee stroke direction | At least 2 cm (13/16")

At least 3 cm (1-3/16") for thin aluminium or wood frames (At least 5 cm (2") for thick wood frames)

➤ When using thin frames (such as thin aluminium), allow at least 3 cm. (1-3/16") of space at the beginning and end of the squeegee stroke, and at least 2 cm. (13/16") leeway on either side.

Squeegee

Screen | Thin

Inaccessible portion | Thin aluminum or wood frame

➤ When using thick frames, allow at least 5 cm. (2") at the beginning and end of the squeegee stroke.

Squeegee

Screen | Thick

Inaccessible portion | Thick wood frame

Framing procedures

1. Attach double sided tape to the inside of the frame. Be sure not to leave any uncovered spaces.

~ Plastic frames are available both pre-taped and untaped. Metal frames are all pre-taped.

➤ DO NOT use foam type double-sided tapes.

➤ Avoid any double-sided tape with an 'aggressive adhesive', as this will damage the screen should it have to be removed for repositioning during mounting, and also after use of the screen.

- The RISO Screen Master mesh can be attached to the frame either before or after screen making. The advantages to attaching the screen first are as follows:
- It is easier to align the screen during multi-colour prints.
- Attaching to the frame prevents curling of the Screen Master, so that making the screen is easier.

However, note the following:
- The frame should be no thicker than 5 mm. (1/4").
- When using a frame smaller than the screen making component's stage glass, the area within 1-2 cm. (7/16"-13/16") off the frame's edge will not be imprinted.

- Similarly, the print width should be approximately 25 mm. (1") less than the width of the squeegee.

- Refer to "Maximum Print Size Table" (in Helpful Hints) as these dimensions take the above factors into account.

- Print quality and screen life will be reduced if the printing area is too close to edges of the frame.

- RISO plastic frames are supplied pre-taped and un-taped.

- We advise the use of the product code N-190 for use when taping frame mounts. This tape has been researched and satisfies the requirements for adhesion **and** reusability.
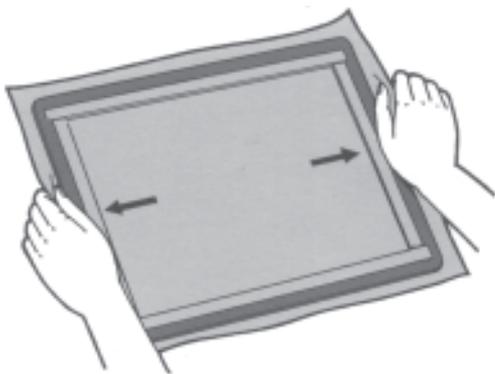
2. With the rough surface facing down, attach the screen to the frame. Start with one of the two longer sides.

3. In the same way, fix the middle of the opposite side, and then attach the whole side while holding the screen tight.
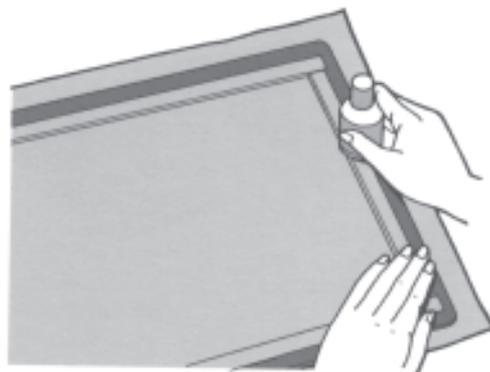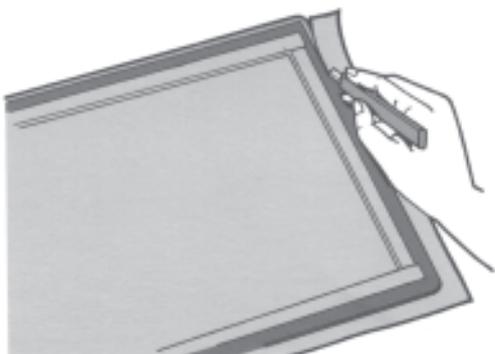
4. Now fix the two shorter sides, making sure that you hold the screen tight.

5. Once you have finished attaching the screen so that there are no wrinkles or slack in the screen surface, rub the edges with the bottom of a correction fluid bottle or similar hard object to make sure that the screen is securely fixed.

6. Trim off any excess screen around the outside of the frame.

- When planning the size of the screen, make it slightly larger than the frame, as this will make mounting easier.

- Avoid over-stretching the screen - you will not when this has been done as plastic frame will bend

- Do not use mechanical framing devices

- Over tension will reduce the print life of the screen - remember the mesh is already pre-tensioned

- It is best to fix the middle first, then start at one side and move to the other.

- Wrinkles or slack in the screen will blur printed images.

- Covering the trimmed areas with tape will reinforce the screen.