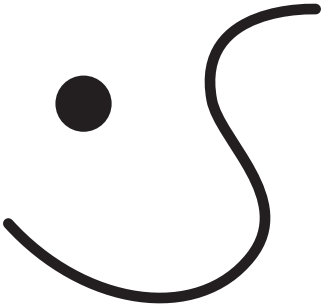
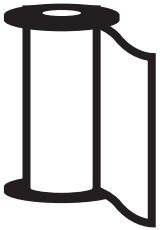
PRINTING WITH A RISOGRAPH

A QUICK GUIDE





RISO

RISO

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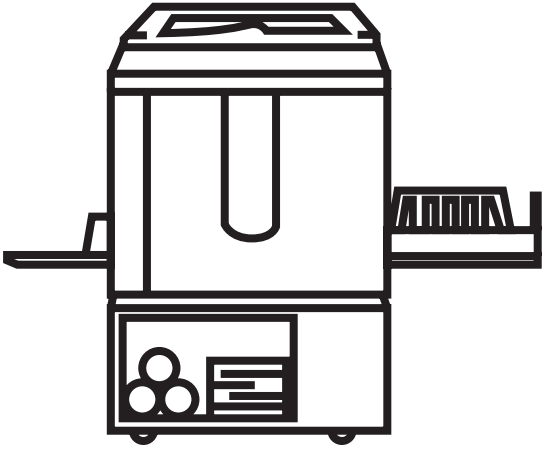
INTRO

During the summer of 2012 I did an internship with Hato Press, a print house based in, London, whose speciality is the Risograph. The internship gave me the opportunity to learn how to work with this machine which has become a very popular printing resource among designers and illustrators. I really did understand what huge amounts of possibilities there are about printing with the Riso, and that, with this particular machine, the printing stage is just as important as the creation and design processes, that combined together, can make a design or illustration job have a much higher level of presentation and wow-factor. I feel like what I learned goes way beyond than pushing the "start" button, it was all about learning the technique and the skill to make a print stand-out, and at the end I can say that I know how to print with a Risograph machine, which is great. Even though the Riso has become very popular in the last couple of years, there are only a few people who know how to operate it, and I very much believe in passing knowledge to the next, hence the motivation for this guide. Although it may seem complicated at first, it is in fact very simple to operate a Riso, but it's necessary to get involved and understand all the stages - from designing to finishing - to do something more than just a print run, and really enjoy the possibilities of this incredible machine.

BACKGROUND

A Risograph is a self-contained duplicator and printer, that has become very popular in the last 5 years, specially among people related to the graphic design and publishing industries, from all around the world. The Risograph machines have been commonly referred to as a Riso, which is Japanese for “ideal”.
Its popularity is due to a group of factors: it’s cheaper and faster than a lot of other print making techniques, say screen printing, and it still produces prints with an artistic and analog vibe; It is highly compensating to print publications and books with a shorter number of copies; it has a limited set of colours including fluorescences and metals; it allows full control of the printing process in an easy way; it is small and simple to use; etc.
The Risograph was invented and is manufactured by the Riso Kagaku Corporation in Japan, with a technology that resembles the mimeograph.
The Riso was designed mainly for high-volume photocopying and printing, and its engineers were more focused on speed than bringing a high standard quality to the copies, which induces a lo-fi feel to whatever you print.
When printing or copying multiple quantities (generally more than 20) of the same original, it is typically far less expensive per page than a conventional photocopier, laser printer, or ink-jet printer.

Nowadays, Riso has become one of the most usual printing resources of publications on bookshelves all around London's bookshops like BEACH.
I believe that this printing resource alone has even straighten up relationships between print houses, artists, studios, schools, galleries and bookshops, and so, it has also helped to reinforce the graphic design scene bases.



RISO'S ANATOMY

1. scanner
scans an image directly into a master

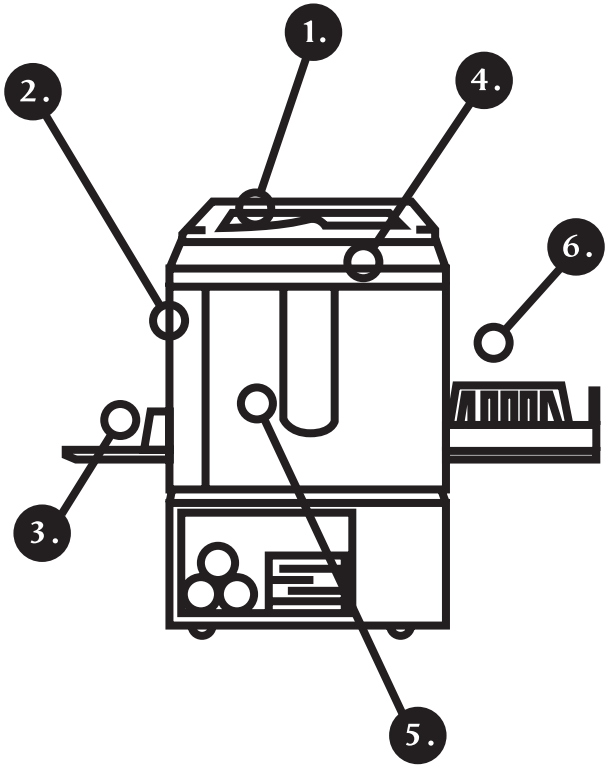
2. master disposal
where the used masters (rubbish) goes after used to be disposed

3. paper feed area
where you place your paper and adjust width and weight settings

4. control panel
allows you to control the print run – arrange position, contrast, speed; you can also start, pause and cancel a print run; where the Riso communicates any trouble e.g. paper jam

5. drum load area
where you place the colour drum. also a "window" into the inside of the machine in case you need to inspect something that's causing ink spots on the print e.g. dirty rolls

6. paper tray
where the prints stay after being printed. flexible adjustable tabs help you take the paper out



*this anatomy graphic was made based on the Riso RP3700, the one I have learned to work with and also the most used among print houses. Older models may not have same features or at the same places as this one as well it may not have some features as newer models.

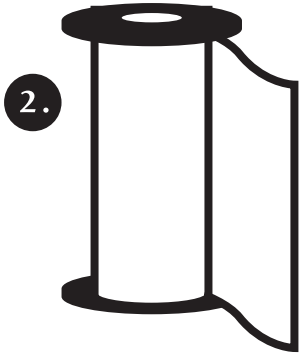
ACCESSORIES

1. colour drum
Each colour has a different colour drum which has a ink cartridge inside. The drum also holds the master.

2. masters roll
the image maker of the Riso. Even though it's disposable it's also eco-friendly and cheap.

3. ink cartridge
Riso uses soy based inks produced by the same company. There are about 20 Riso colours available.

1.



2.

3.

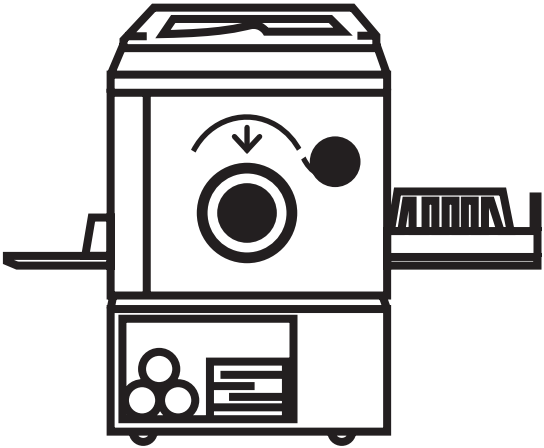
HOW IT WORKS

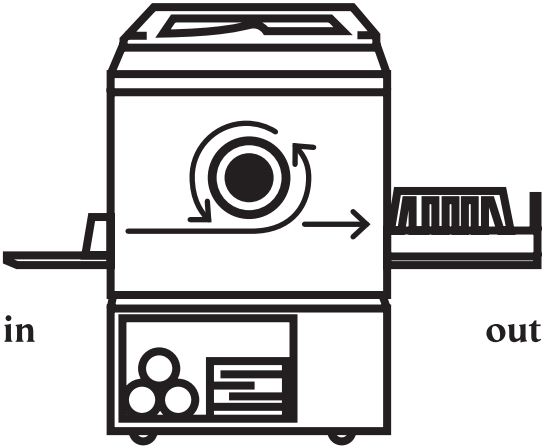
MASTER MAKING

One you've send in your file, the machine creates a master which is made out of a thin material that looks like paper. The machine has tiny heat spots on a thermal plate that creates holes on the master that correspond to the image you've sent through. The master sheet than sticks around the colour drum, allowing the ink to go through these holes and on to the paper. The master is the same during the whole print run, and it's disposed automatically when you send in another image to print.

PRINT RUN

After the master has been created (it takes about 30 seconds to 1 minute) it is time to start the print run. The paper is set up on the paper feed area and once it goes inside the machine it's only milliseconds before it's out again. While the paper goes through, the drum rotates at a great speed while the ink transfers on to the flat sheet of paper. The paper is then spit out of the machine on to the paper tray.



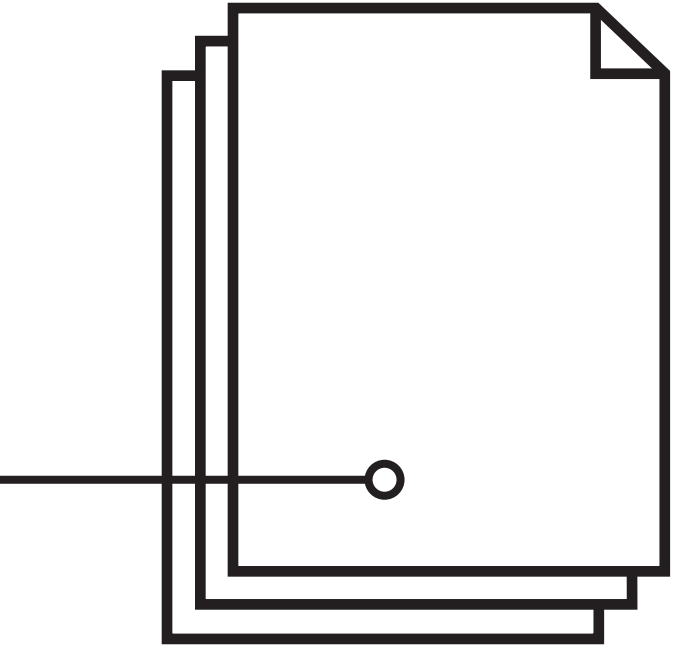


in **out**

FILE SET UP (PDF)

When it comes to printing directly a file from a computer to a Riso, there are certain rules you must obey, specially with complex design jobs.
You should have in mind bleed, size, colours, and colour effects - transparency & overlays - separations, ink coverage, registration, among others. It's highly recommended to have all of this matters in consideration before and while doing the design work, and not when setting it up for print. By doing so you'll prevent bad surprises and make the most out of this printing resource.

Most Risos only print up to
A3 297mm x 420 mm
But the recommended
printable area is
291x397mm



FILE SET UP (PDF)

COLOURS

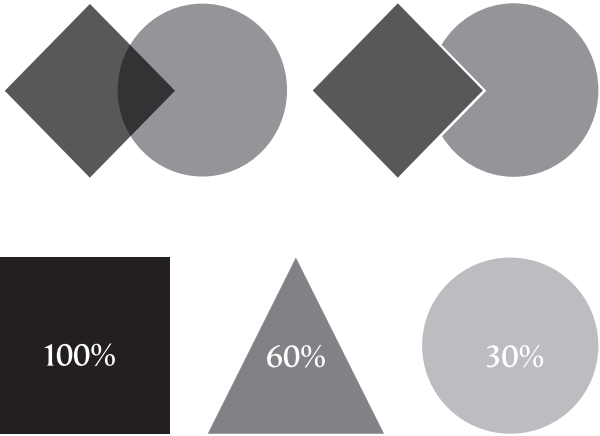
There are about 20 spot colours available from Riso. This colours are not PANTONE system based. Each print house has a different amount of colours, and if you're looking for a specific set of colours you should do a bit of research first. Riso popularity apart from a good quality-price range, is based on quite interesting colours that Riso has like (flat) metal colours such as gold and silver, and fluorescent colours, like neon pink and orange.

FILE SET UP (PDF)

COLOURS

Colour overprint works like the “multiply” effect on adobe programs (Photoshop, Illustrator, Indesign, etc.) but you can always avoid it, if you wish to, by knocking out the object.

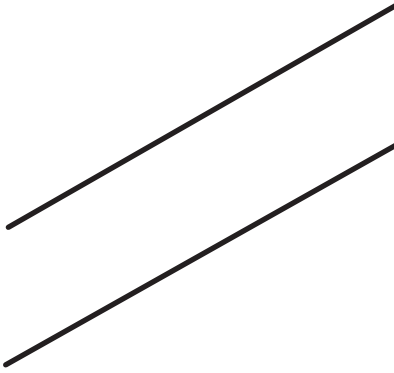
You can also play with colour transparency in order to tone down tones. The Riso will read this percentage and convert it into halftone dots, but you still get the illusion of using different types of blue giving you also endless possibilities of generating new colours.


100%
60%
30%

FILE SET UP (PDF)

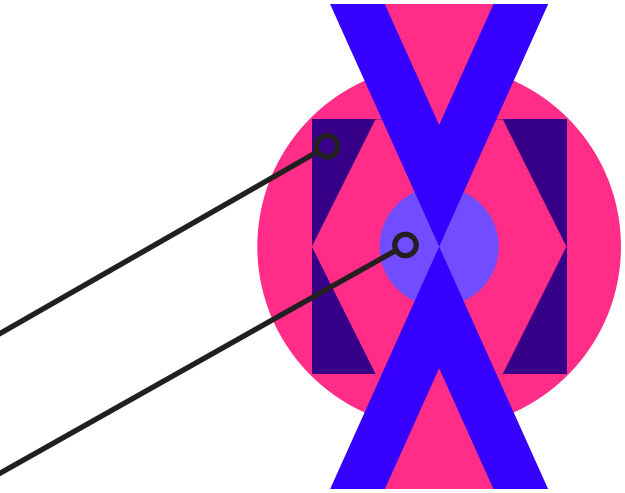
COLOUR SEPARATION

For a multi colour print you need to provide each layer as a separate BLACK page. Each colour is printed separately, from different pages of a document - each colour per page.



Intentional overlay
The shapes don't need to be knocked out.

Transparency
This shape has 70% of blue, and this percentage is then passed on to the black.



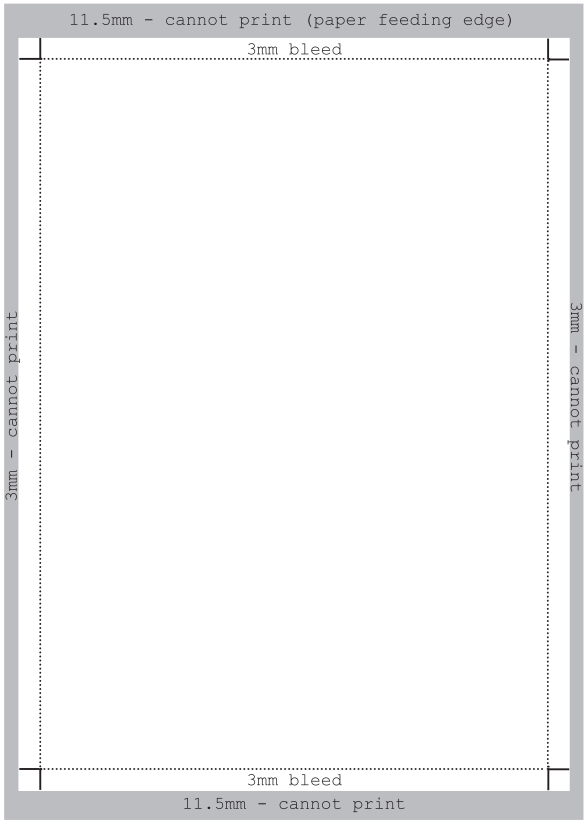
BLUE

PINK

FILE SET UP (PDF)

PRINTABLE AREA & FULL BLEED

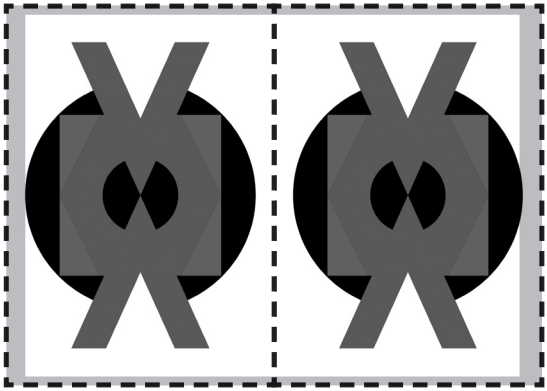
One of the restrictions of the Riso is the fact that it has a recommended printing area, not giving a lot of space to print full bleed jobs. The reason why this happens is because the paper is taken through the machine with a set of rollers, these rollers applying pressure to the paper will pick up ink if it's heavily applied in this area. It's best to keep to feed edge of the paper free from heavy ink. This keeps the rollers cleaner and will keep the prints better.
Although the Riso can't print full-bleed, this is attainable in the finishing, by cutting to crop marks.
Next, you'll find the measurements of the maximum printable area for all printing jobs, however it changes slightly depending on the inked area. If the paper is to be heavily inked all over it's suggested either a lighter tone of the colour and/or to make the boarder larger.
The ink has a tendency to show itself when doing multiple layers. It's easy to rub out with a rubber, but best again to think of your artwork when designing.


11.5mm - cannot print (paper feeding edge)
3mm bleed
3mm - cannot print
3mm - cannot print
3mm bleed
11.5mm - cannot print
A3

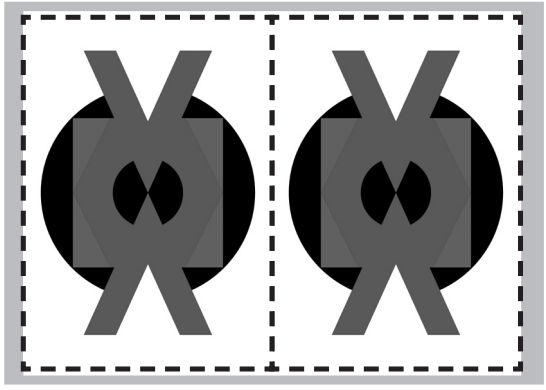
FILE SET UP (PDF)

SIZE

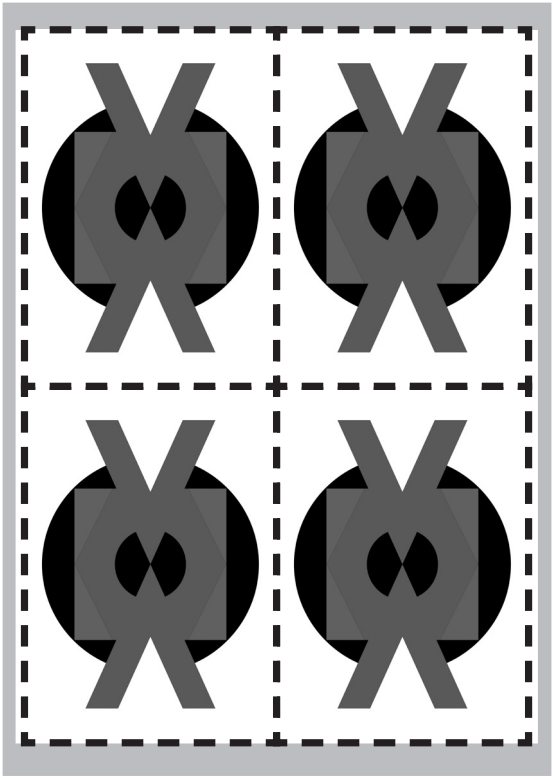
It's good to think economically when printing with the Riso, if you artwork is smaller than A3 think about doubling up on the same sheet. If doing flyers or booklets it is possible to put all on one sheet and then we can cut to the correct size afterwards.
Here are some examples of the same artwork, set up as A4, A5, and A6.
Remember you still need to separate layers making sure you're placing the artwork in the same position throughout.



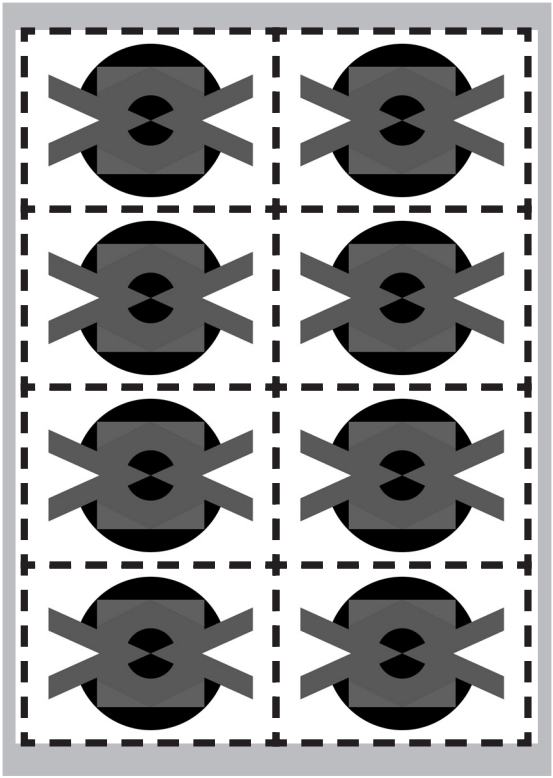
DON'T



DO



A5



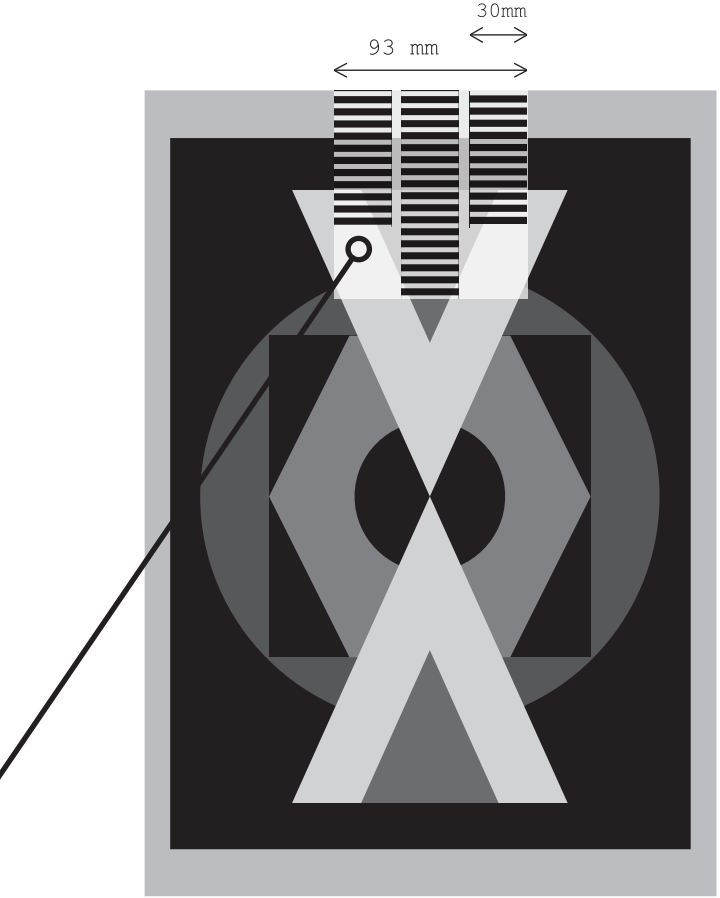
A6

FILE SET UP (PDF)

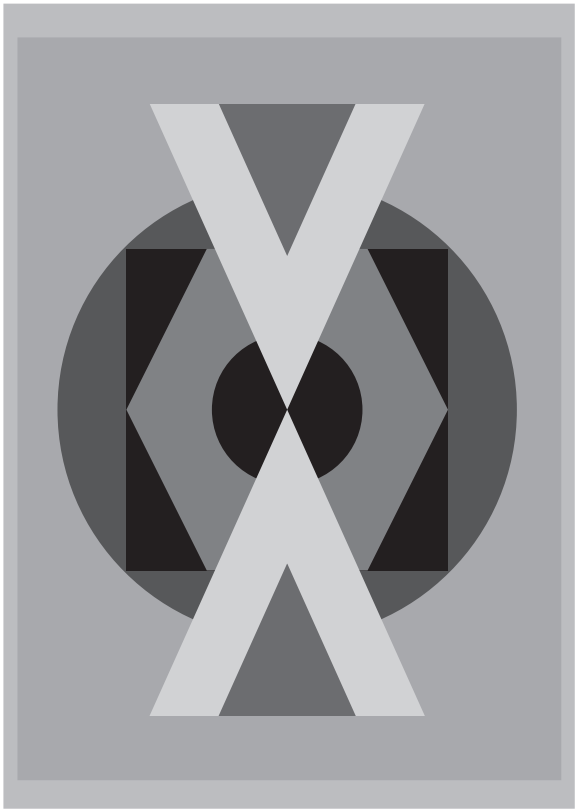
COVERAGE

The Risograph uses very bright-coloured inks, like the ones used in lithography, and therefore it's very important to be careful with the way you use them in order to avoid mistakes like blurs of ink, unwanted spots or roller marks. One of the thing to look out for is the quantity of ink that an artwork actually takes on. The more layers of colours and coverage the artwork has the more likely it is that the artwork will show those mistakes. To allow for the inks to dry for a long time is a way around it, but there are also other ways to make sure you have the best results.
If the artwork as a very dark background colour, that takes a lot of space and weighs heavily on the paper, than it should be printed after all the other layers. Also, you can increase the border area so that the rollers don't "catch" the ink of the background. Or you can easily light the colour to a lighter tone. A light artwork with a lot of coverage doesn't necessarily have to increase the border margin, but if the coverage is beyond 50% (of paper space and colour tones), then the margins should be increased.

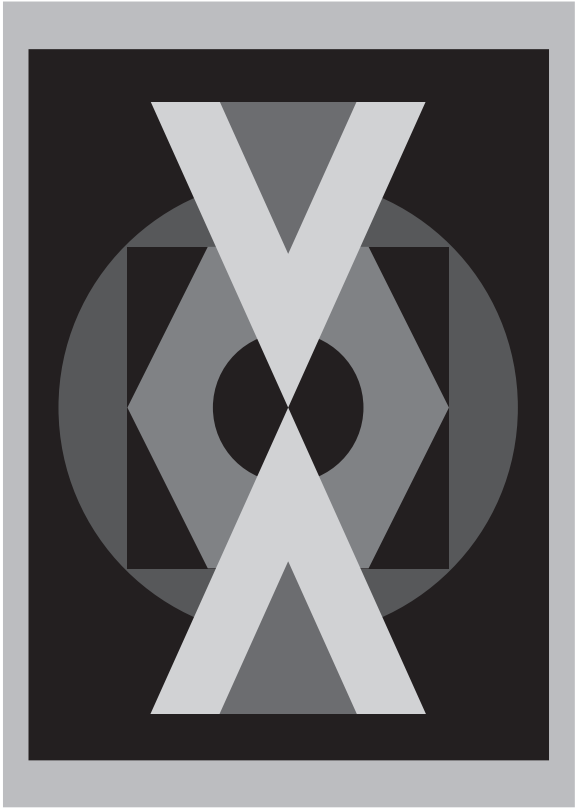
No heavy ink in this area
to avoid roller marks


30mm
93 mm

50% or less : full (regular) coverage



Above 50% : less coverage



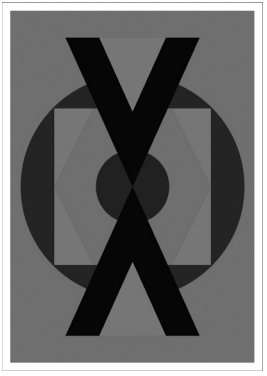
increase margin on all edges

FILE SET UP (PDF)

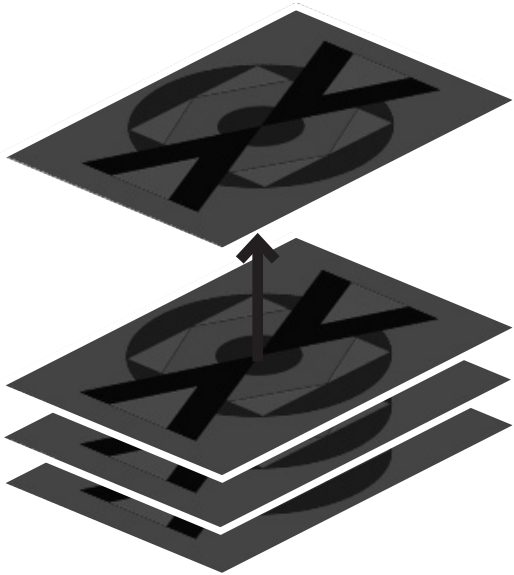
HEAVY PRINTS

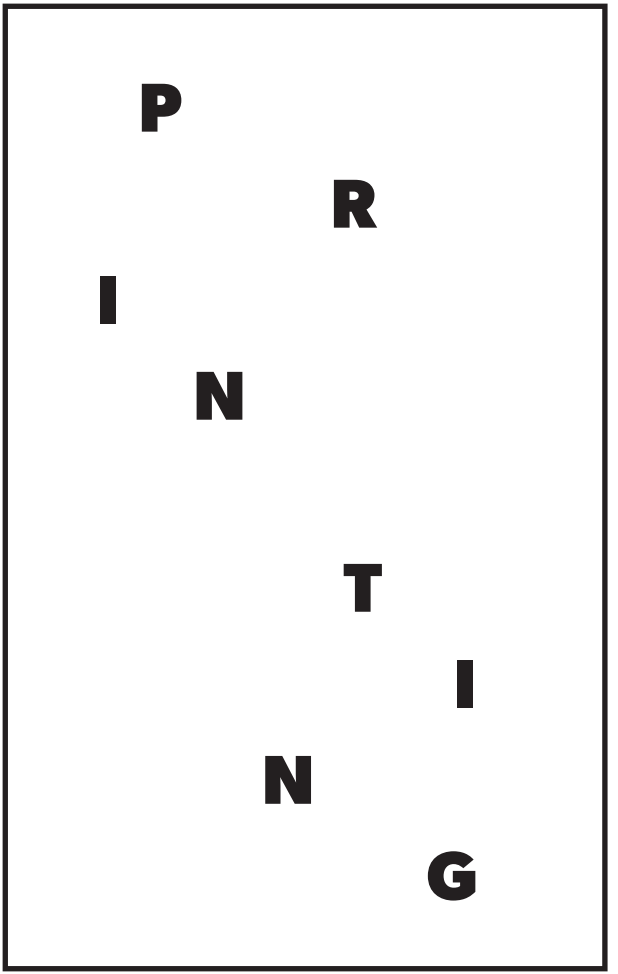
Prints with almost full coverage and/or with a big run have a tendency to leave ghost stamps on the back.
The heaviness of the ink of a print with a lot of layers plus the weight of the sheets of paper pressing against each other generate this type of effect.
Remember that the Riso was not designed to produce high quality art prints. Still, it's a very fun printing process and you'll need to embrace it's flaws in order to enjoy it.

Front



Back




P
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T
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N
G

Once the file is set up and ready to go, it's time to start the print run. The file can be sent to the printer via scanner or via usb cable (like a regular printer).

If you choose to use the scanner, you still need to send each colour individually and set to black.

If you choose to send it directly from the computer, you need to make sure you have the driver installed. (only works with PCs).

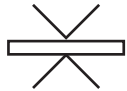
The Risograph is very easy to work with but the smallest mistake can make the biggest mess so be focused and follow the rules and steps on the following pages to make it right first time.

PRINTING

PAPER & PAPER FEED

Choosing your paper is just another vital step when it comes to printing with a Riso. The weight of paper you can print on ranges from 50gsm to 250gsm maximum, and the paper feeding settings – angle and pressure – on the machine change accordingly. These settings vary from model to model. Some models don't have it at all. You need to figure out what setting to use according to the features of the paper you're using in order to avoid rips, paper jams, and other sort of headaches.
Most risographs have the option to choose between heavy or thin paper, a setting which can be changed in a switch above the paper feeding area. Make sure you change this according to the type of paper you're using.

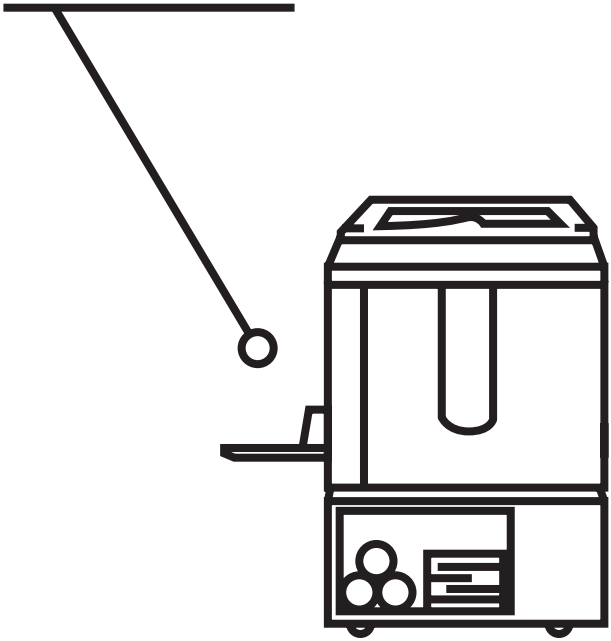
this option:
thin paper



this option:
heavy paper

If you are new to printing and you want to print on a thick and textured paper you should leave it to the professionals, but you should be fine with a normal type or recycled paper up to 150gsm.

Place paper in the paper tray;
Firmly, adjust the side panels according to the size of the paper;
Change the paper settings according to the weight of the paper if necessary;

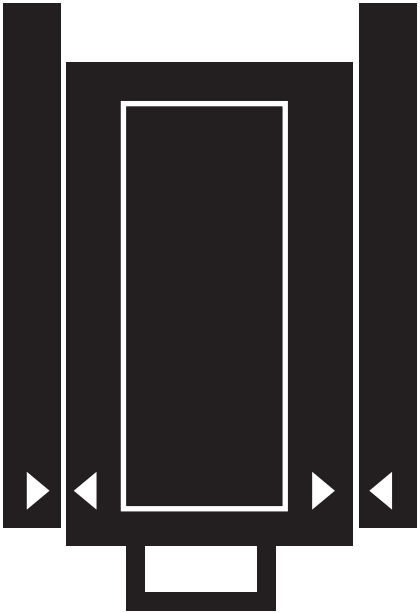


PRINTING

COLOURS & COLOUR DRUMS

With a regular Risograph machine you need to print each different colour separately, since the Riso only takes one colour drum at a time.
If you're printing a publication, you should print a colour on all of the pages that it's present before changing to another colour.
Make sure you keep the colour drums away from rotting sources like heat or water by keeping them safe in the drum boxes when not in use.

Open the front door;
Click the green lighted button to unlock the drum and pull it out;
Lift the drum and put it in the drum box or somewhere stable;
Take the new drum and line the arrows of the rail with the ones on the drum;
Push it firmly into the machine and close the front door;



PRINTING

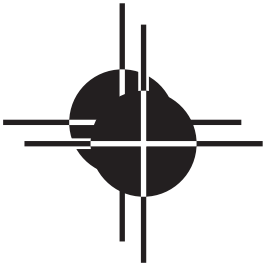
MAKING A MASTER

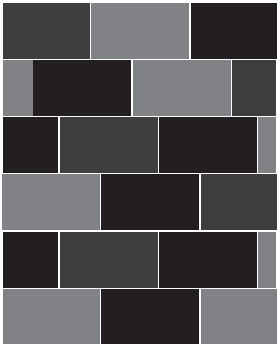
After setting up the desired colour, you can send in your file via pc or scanner.
The Riso has to be clear of print jobs in the print job panel. If you have already finished the job and the machine has not read it press M. This will communicate that you are ready to make a new master.
Send the file through and press START.
If the master making as failed (blank master), repeat. If the master jammed the control panel will show instructions on how to solve the situation.
If the image appears to be wrinkled or with weird spots on it, open the front door and check the master on the drum. Pull it out and reattach it firmly if necessary.

PRINTING

PRINT RUN & REGISTRATION

Once the master has been created, the panel will switch to print run mode.
Insert the number of copies wanted by pressing C followed by the digits of your quantity on the number keyboard.
Immediately after the making of the master it is recommended to do sets of 3 copies at a time, measuring the middle sheet until the image is in the desired position.
You can shift the image location without the need of making a new master. Simply use the arrow buttons to move 0.5mm at a time. The fine mode will allow you to move 0.25mm at a time.
The registration should always be done based on this middle sheet since the first and last copies are always expanded.
Once you have achieved a desired position, you can start the print run. The Riso wasn't designed to do large runs with spot on registration so you'll witness that the design will shift along the way. This can be corrected by using the arrow keys, while the run is going, without having to stop the run to do it.
Once the print run is finished simply put the stack of paper on a stable place for the ink to dry.



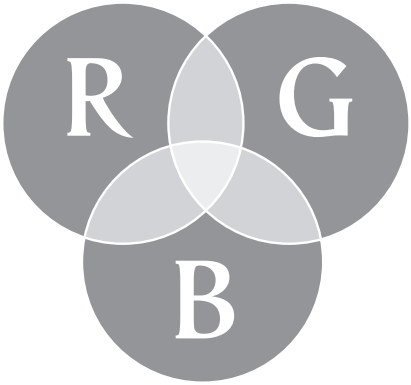


PRINTING

CMYK & RGB

Even though the Riso was not designed to do complicated or precise colour reproduction, it is still quite achievable to reproduce work on a CMYK or RGB system. To do so, you only need to separate each channel into a different file and set it to gray scale. Keep track of what colour corresponds to what file, or don't, and allow yourself space for chaos. You also have total freedom to chose what colour you want to use instead of cyan (Riso light or medium blue), magenta (Riso pink), yellow and black, for example use flat gold to print the cyan channel. The same occurs with RGB printing, but you have to bear in mind that the colours will not blend the same way as on the screen.

C
M
Y
K


R
G
B

Edited by
Mariana Lobão

London College of Communication
2012

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RISO

RISO