

Designing for Reproduction & Print

Lesson 1

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Introduction

It is important for designers to have a good understanding of how the work that you create will be reproduced.

Professional reproduction solutions can be very different from solutions available to you in university. These lectures will help you plug those knowledge gaps.

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Today's Lecture:

- ▶ RGB & CMYK.
- ▶ Colour Gamut.
- ▶ DPI & LPI.
- ▶ Halftone Screening Process.
- ▶ CMYK & Printing Plates.
- ▶ Printer Errors & 'Moire' patterns.
- ▶ Colour Profiles & Colour Space.
- ▶ Spot Colours & Pantone Colours.

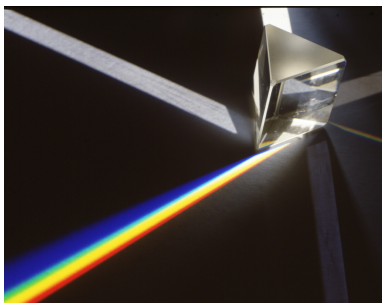
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RGB vs CMYK

- ▶ RGB – Red, Green & Blue, are the colours used in TV, Computer monitors and other screen or projection based equipment.
- ▶ It is an 'Additive' colour mix because they are able to create the illusion of colours by adding their light together.
- ▶ These beams of light scan so quickly over the screen that we cannot usually see them.

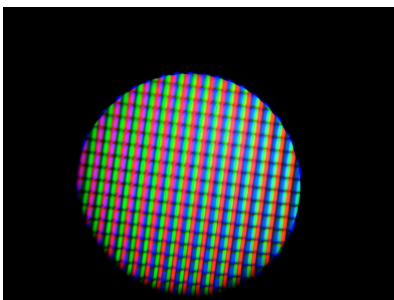
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RGB



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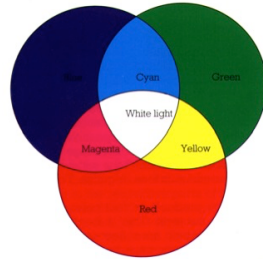
RGB



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RGB Colour Mix

RGB – As each coloured light is added this is the effect of the mixing of the colours.



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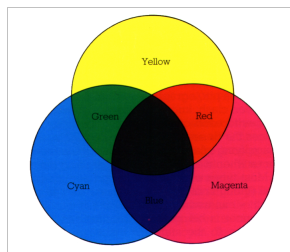
CMYK

- ▶ CMYK – Cyan, Magenta, Yellow & Key (Black) make up the four 'Process Colours'.
- ▶ Most colours can be made by adding varying amounts of these four colours, but not all colours can be made.
- ▶ Our eyes actually mix the process colours...
- ▶ ...because we are actually seeing an image made up of carefully created CMYK dots.

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CMYK Colour Mix

CMYK – As each additional ink is added a different mix occurs.



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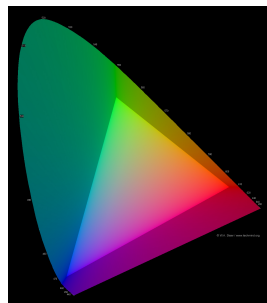
RGB vs CMYK

- ▶ Colour needs to be controlled!!
- ▶ Professional design applications allow you to assign 'profiles' to your documents to control the colour.
- ▶ Colour profiles are not all the same, each has a different capacity for colour known as 'Gamut'.
- ▶ Never trust a monitor unless it is in a controlled environment and has been calibrated.

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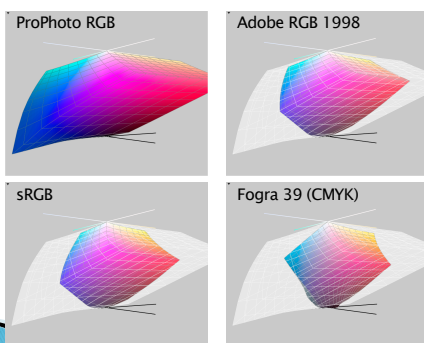
Gamut

Generic RGB colour gamut compared with the gamut of the human eye.



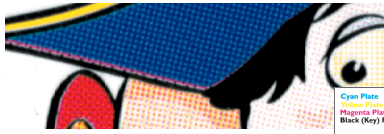
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Gamut



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CMYK



The dots can be seen when magnified.



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DPI & LPI

- ▶ DPI – Dots Per Inch refers to the density of dots in an image. Also referred to as the image resolution.
- ▶ Documents for print should be at 300dpi to give a smooth sharp image.
- ▶ LPI – Lines Per Inch refers to the lines of dots that make up a Halftone Screen.
- ▶ The more lines – the finer the dot pattern – the better the quality.
- ▶ 65, 85, 100, 120, 133 & 150 are common sizes.

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DPI



300dpi



72dpi



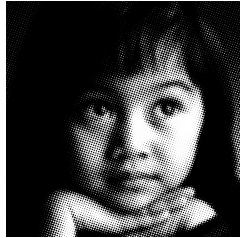
36dpi



18dpi

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LPI



65 lpi

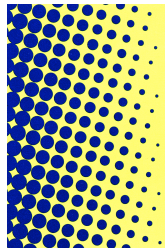


100 lpi

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Halftone Screens

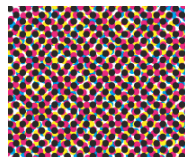
- ▶ The dots can be difficult to see unless magnified.
- ▶ The bigger the dot – the denser the colour.
- ▶ Halftone Screens are measured in LPI.



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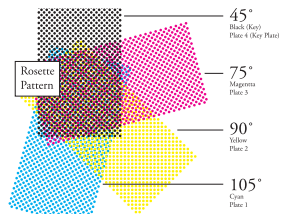
Positioning Screens

- ▶ To avoid the lines of CMYK dots being seen when printed together the screens are set to different angles.
- ▶ The dots blend together to create the 'Rosette Pattern'.



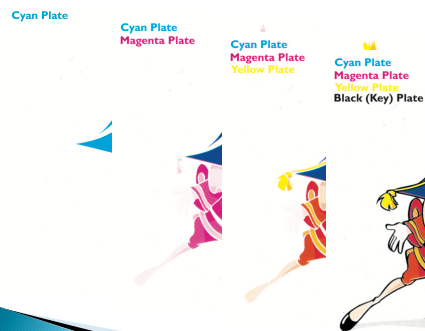
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CMYK Plate Angles



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CMYK Plates



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Print Errors

- Sometimes the screens are badly positioned and colour offset is obvious.



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Moire Pattern

- ▶ The same effect will occur if you scan a printed image from a magazine or book.
- ▶ Because the image has already been printed it will have already been screened and will be made up of dots. Rescreening a screened image will create a Moire pattern...again, this is bad!
- ▶ Try to scan from photographs or film if you can not get a digital file.
- ▶ If you must scan from a printed image use the scan software to 'de-screen' the image...but don't expect great results.

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Colour Profiles

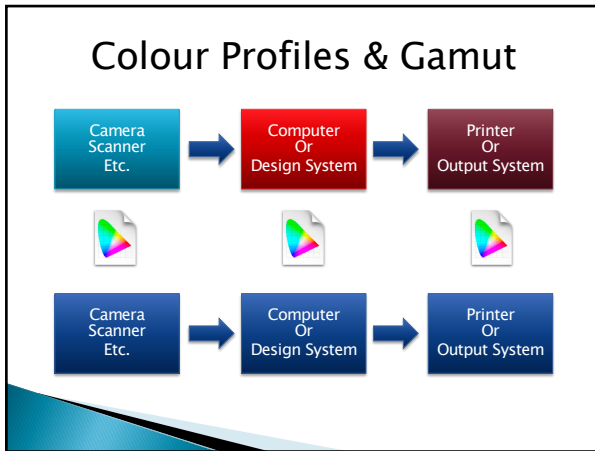
- ▶ All colour digital equipment will use a Colour Profile at some level, this can be a Generic Profile or a Custom Profile.
- ▶ ICC (International Color Consortium) Profiles are the standard for digital colour management.
- ▶ You can custom create your own profiles by using a variety of calibration devices.
- ▶ You will need to control both your RGB & CMYK colour space to get good colour output.

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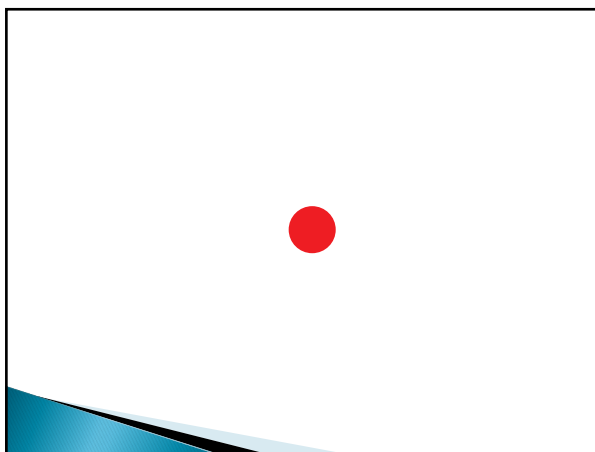
Colour Profiles & Gamut

- Profiles are different & have a different effective Gamut.
- RGB – If you are unable to do your own calibration you should at least set your RGB colour space to 'Adobe 1998'.
- CMYK profiles will change dramatically depending on what paper your work will be printed on.
- CMYK – For Matte paper use an Uncoated Fogra Profile & for a SemiGloss or Gloss paper use a Coated Fogra Profile.

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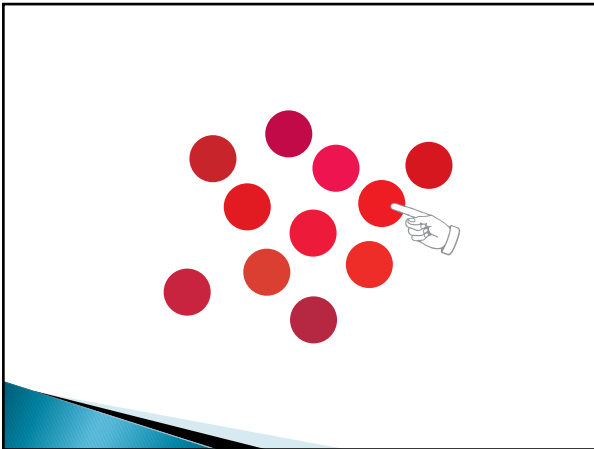
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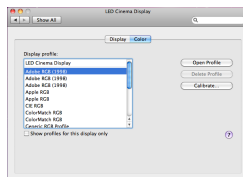
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Setting your Colour Space

- ▶ You can set the Mac OS colour space in System Preferences.
- ▶ Virtually all Mac's will have a default profile designed to make the screen look more vibrant...
- ▶ ... you WILL need to change this to get better colour control.

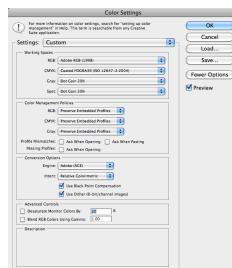


This is also where you choose any custom profiles that you have created.

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Setting your Colour Space

- ▶ All of your design applications will allow you to assign colour profiles to your work.
- ▶ Adobe applications are fairly straight forward to set colour space.



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Spot & Pantone Colours

- ▶ A Spot Colour is an extra colour to CMYK printing.
- ▶ It is a unique colour and not a composite of CMYK.
- ▶ It will create strong solids and smooth tones without Rosette patterning.
- ▶ Pantone is a referencing system for CMYK colour mixes and Spot Colours.



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Spot & Pantone Colours

- ▶ There are many different Pantone Swatch Libraries...
- ▶ ... Coated, Uncoated, Composite CMYK, Metallic, Pastels and so on...
- ▶ They are very useful when talking colour with clients.
- ▶ They can be expensive to buy, but cheaper than a print rerun.



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Recap

- ▶ RGB – Colour mix for screen based design.
- ▶ CMYK – Colour mix for print based design.
- ▶ DPI – 300dpi for print, 72dpi for screen.
- ▶ LPI – Quality of the halftone screen.
- ▶ Halftone Screen – Separating the colours of the design into printing plates.

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