

## How To – Calibrate a Monitor

The following is a step-by-step guide to calibrating a display for accurate softproofing in the Blackmagic / Veripress SoftProof application. The process described applies to calibrations for any Softproof and press standard, but for this guide Blackmagic will be used to calibrate and verify an Apple Cinema HD display to an ISO Newspaper Press Standard.

A Press ICC match profile and a Calcheck Chart (imported or created using Blackmagic/Veripress) for the press standard to be softproofed are required for display calibration and verification. A supported Spectrophotometer instrument capable of reading monitor displays is also required.

For this guide the following will be used:

- Press Match ICC Profile - ISOnewspaper26v4.icc, defining a common newspaper press standard
- Calcheck Chart - Newspaper, a 72 patch verification chart created with Blackmagic from the ISOnewspaper26v4 icc profile, including  $\Delta e$  (CIE2000) and  $\Delta H$  tolerances.
- Spectrophotometer - x-rite EyeOne Pro.

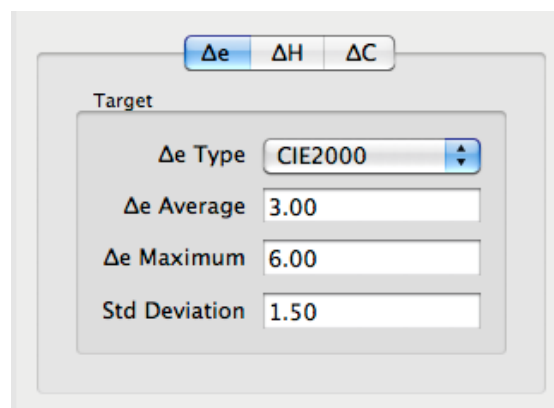
### Calcheck Chart

If a Calcheck chart based on the press standard to be softproofed is not already stored in your Blackmagic Workbench database, then one will have to be created and saved.

The chart to be used for this example was created with 72 patches using the *Generate patches from ICC* option in the toolbar of the Calcheck Chart data type (see product manual for details).

The following delta ( $\Delta$ ) tolerances were configured:

- $\Delta e$  Type - set to CIE2000, the recommend type for measuring colours on a monitor display.
- $\Delta e$  Average - 3.00
- $\Delta e$  Maximum - 6.00
- Std Deviation - 1.50

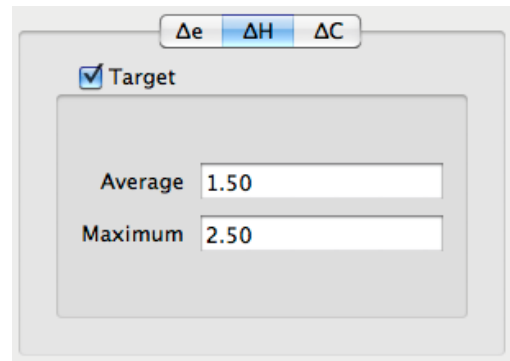


- Cyan, Magenta, Yellow and Black  $\Delta e$  tolerances - 5.00
- Paper and Gray patch  $\Delta e$  tolerances - 3.00

Colour	Name	Lab	$\Delta e$ tolerance	$\Delta H$ tolerance	$\Delta C$ tolerance	Patch Type
	Cyan	59.11, -23.94, -27.10	5	2.5	4	Cyan
	Magenta	55.50, 47.62, 0.68	5	2.5	4	Magenta
	Yellow	80.37, -1.38, 61.56	5	2.5	4	Yellow
	Black	36.76, 1.48, 4.46	5	2.5	4	Black
	Paper	85.20, 0.90, 5.18	3	2.5	4	Paper
	25% Gray	69.09, 1.07, 4.80	3	1.5	4	Gray
	50% Gray	54.96, 1.28, 4.73	3	1.5	4	Gray
	75% Gray	44.25, 1.44, 4.66	3	1.5	4	Gray
	A01	84.07, -0.14, 16.01	6	2.5	4	Generic

The  $\Delta H$  tolerances are active, turned on using the Target check box and configured:

- Average - 1.50
- Maximum - 2.50
- Paper and Gray  $\Delta H$  tolerance - 1.50

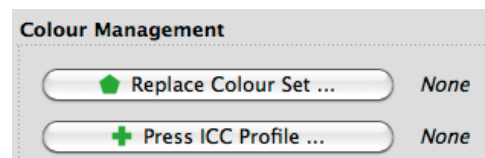


## Configuring the Press

The Press data type is used to emulate the properties of press for softproofing.

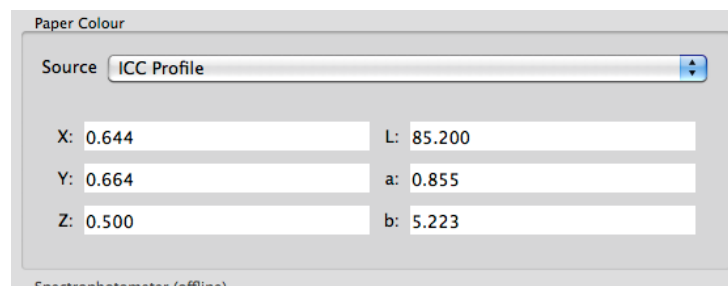
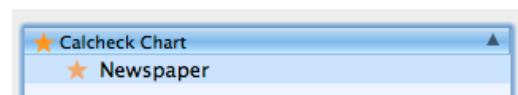
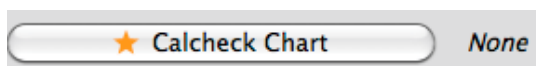
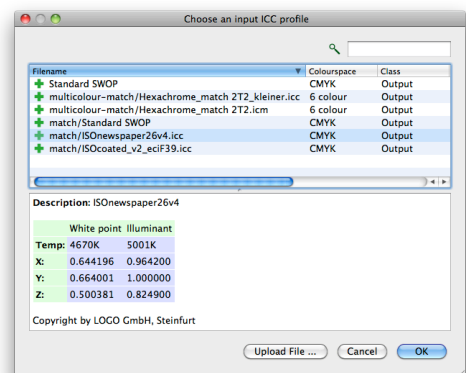
To create a press:

1. Select the Press Data Type in the Workbench Application of Blackmagic.
2. Select the New option in the File Menu and rename the new Press item - *Newspaper (ISO 26v4)*
3. Assign the Press Match ICC profile to the Press by clicking the Press ICC Profile... button in the Colour Management panel of the Press and then selecting the ICC - *ISOnewspaper26v4* - from the pop-up chooser, then click OK.



**Note:** If the Press ICC profile you wish to use is not in the Blackmagic/Veripress ICC folders, then select the Upload File option.

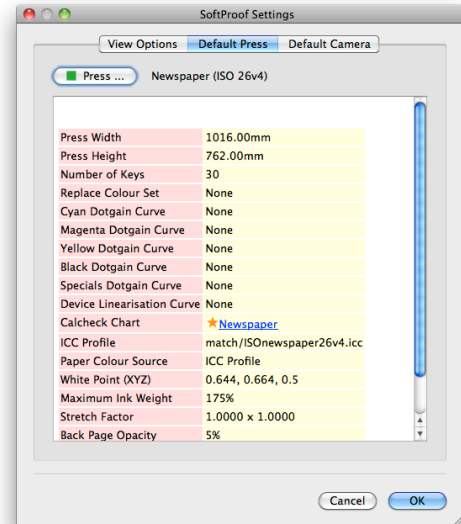
4. Assign the Calcheck Chart to the Press by clicking the Calcheck Chart button in the Colour Management panel and then selecting the chart - *Newspaper* - from the chooser, then click OK.
5. Set the Paper Colour for the Press by selecting ICC Profile from the Paper Colour drop-down at the bottom of the Colour Management panel
6. Save the Press configuration by selecting the Save option in the File Menu.



## Setting the Softproof Default Press

Now the Press configuration should be set as the Default Press in the Softproof Application. To set the default press:

1. Open the Softproof Application via the Application Menu.
2. Click on the Softproof window, then select the SoftProof Settings... option in the File Menu.
3. Select the Default Press tab in the SoftProof Settings window.
4. Click the Press button, select the Press - *Newspaper (ISO 26v4)* - in the chooser, then click OK.
5. Click OK in the SoftProof Settings window to save the Default Press.
6. Close the Softproof Application.

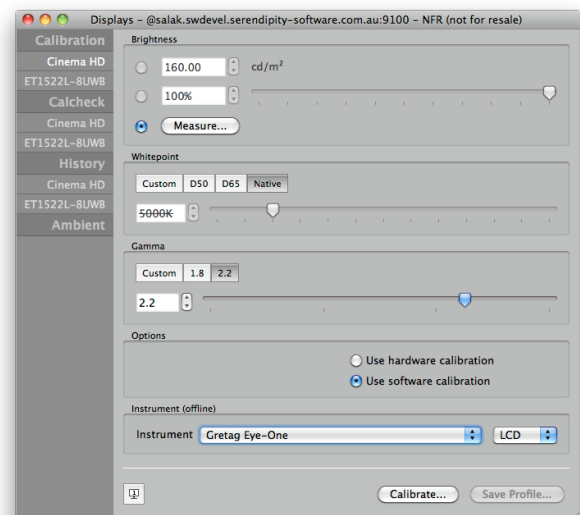
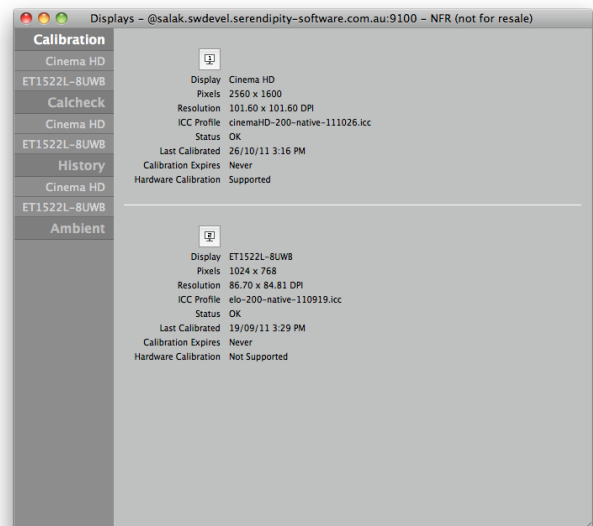


## Calibrating your Display

To begin Display calibration, first plug in a supported spectrophotometer - *x-rite i1 Pro* - then open the Displays Application via the Application Menu.

The Displays application will open on the Calibration summary tab (highlighted in white on left-hand function menu). This tab shows data about the attached monitors, including the monitor name and resolution (in DPI) if the information is provided by the operating system, as well as the monitor's calibration status.

1. Click on the monitor number button above each summary to identify each monitor and determine which display is to be calibrated for proofing - *Cinema HD (monitor 1)*
2. Select the monitor - *Cinema HD* - from the names listed under Calibration in the left hand function menu.
3. Choose an instrument - Gretag Eye-One - from the drop-down list of compatible spectrophotometers in the Instrument section. Choose a display type - *LCD (default)*
4. Choose which calibration method to use from the Options sections:
  - a. Use Hardware Calibration - When supported, this option uses the monitor's own internal hardware for calibration, allowing the screen

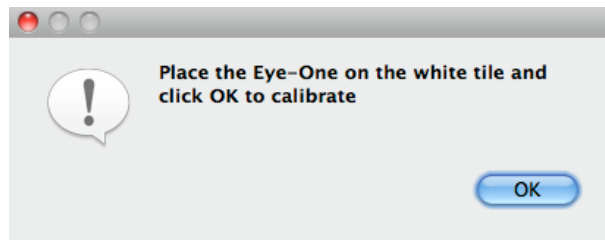


- b. Use Self Calibration – Available on some high-end graphics monitors. Uses the monitor’s own internal hardware and calibration routines for calibration.
  - c. Use Software Calibration – Calibration is performed using the Displays application software. In this case the monitor brightness level will need to be adjusted manually, using a spectrophotometer and the Measure button in the Brightness section (see manual).
5. For this guide - *Hardware* is selected as the Cinema HD display allows remote brightness adjustment.
  6. Set the desired display brightness in candela ( $\text{cd}/\text{m}^2$ ) or percentage (0-100%) in the Brightness section - *200.00  $\text{cd}/\text{m}^2$*
  7. Set the desired whitepoint for the display in kelvin (K) in the Whitepoint section - *Native*.
  8. Set the gamma correction for the display in the Gamma section - *2.2*

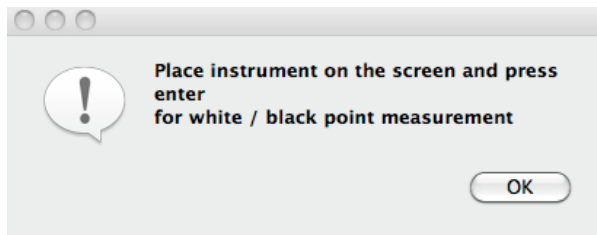
**Note:** The most suitable Brightness, Whitepoint and Gamma settings to use will vary from display to display. Some manufacturers or dealers may suggest optimal settings for proofing, but if colour verification fails, the settings can be altered.

9. Hit the Calibrate button, then follow the onscreen instructions for your instrument to begin display calibration.

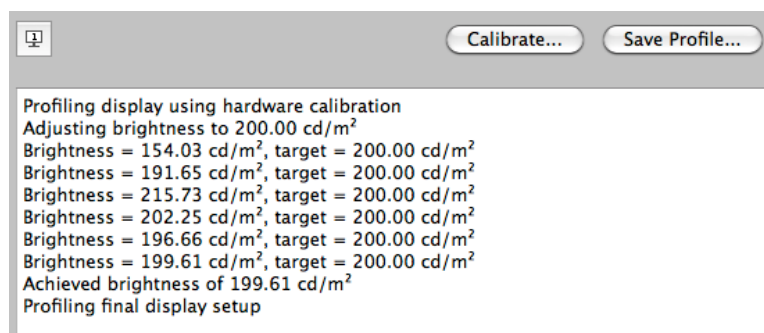
For the i1 Pro, first:



then:



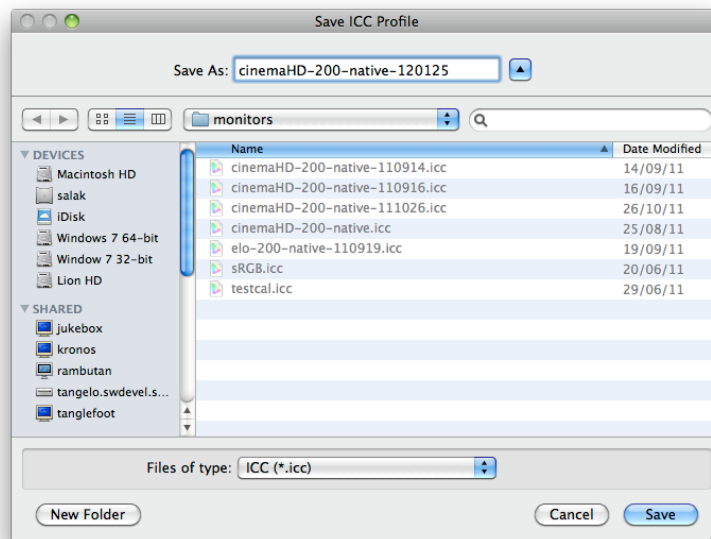
The white panel at the bottom of the the Displays window will show the progress of the calibration process.



When calibration is complete a file chooser window will appear.

10. Name the display ICC created and Save it in a folder of your choice - *cinemaHD-200-native-120825*

The ICC profile is automatically saved as your operating system default monitor profile.



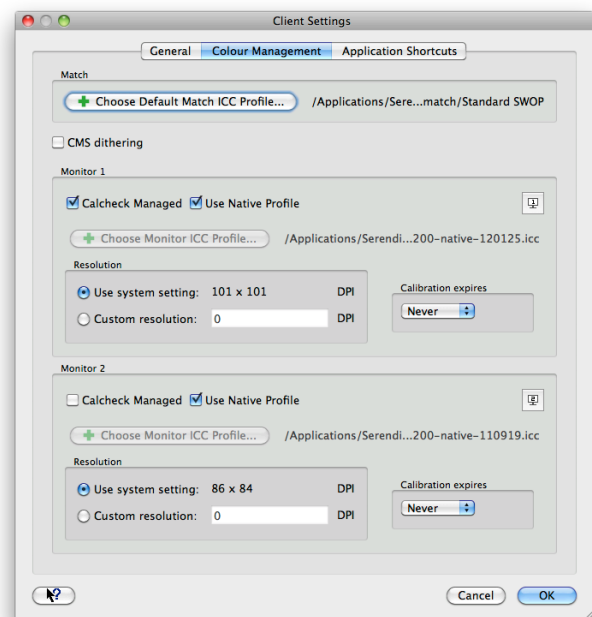
### Assigning the Monitor ICC profile in Blackmagic/Veripress System Settings.

The ICC profile created and saved during the display calibration process needs to be assigned as the Monitor ICC Profile in the Serendipity Client Preferences.

1. Open Preferences in the Serendipity Client Menu (Mac OS X) or the File Menu (Windows)
2. Select the Colour Management tab - this tab details the ICC profiles and resolution for all monitors used by the client.
3. In the section relating the proofing display, tick the Calcheck Managed and Use Native Profile check boxes.
4. When the Use Native Profile box is ticked the Choose Monitor ICC Profile field will be grayed out (non-editable), but should display the saved ICC profiled as the assigned monitor profile.
5. If Use Native Profile is already active in the Client Settings, the ICC profile should already be assigned.

**Note:** For Serendipity Clients running on Windows, the native ICC profile is not automatically updated. For Windows, simply shut down and restart the Client, the Client reads the Windows operating system native profile on restart.

6. Once the native ICC profile for the monitor has been assigned, close Client Preferences.



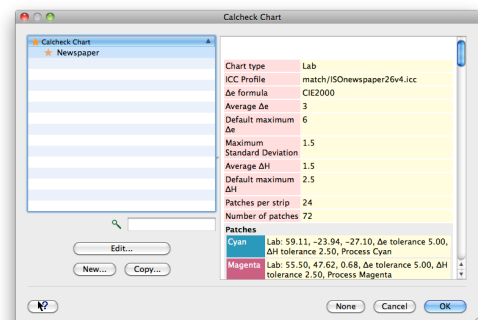
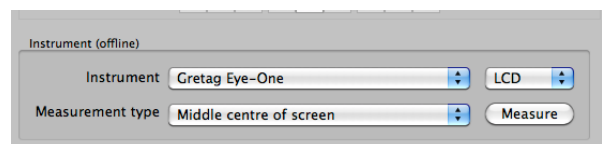
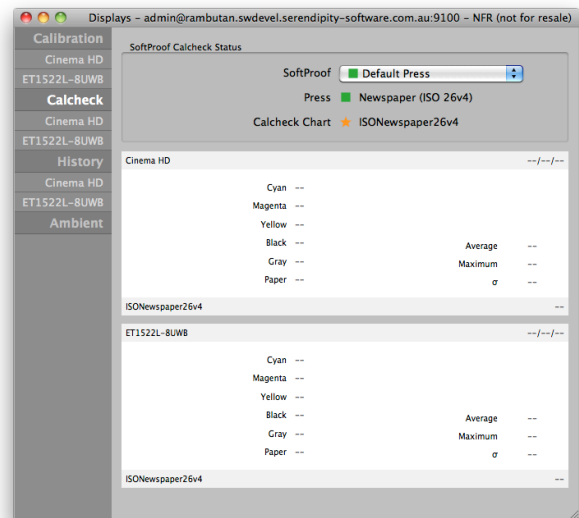
## Calchecking the Display

The final step is to use the Calcheck function of the Displays Application to verify your calibrated proofing monitor can accurately represent the print gamut being softproofed.

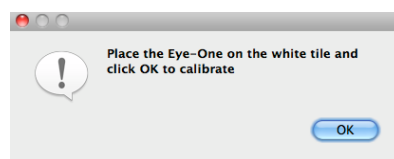
1. Open the Displays Application, then select Calcheck in the left hand function menu
2. Under Softproof Calcheck Status, check that Default Press is selected in the Softproof field, that the correct Press (*Newspaper (ISO 26v4)*), and Calcheck Chart (*Newspaper*) are selected
3. Select the monitor - *Cinema HD* - beneath Calcheck in the function menu.
4. Choose an instrument - *Gretag Eye-One* - from the drop-down list of compatible spectrophotometers in the Instrument section. Choose a display type - *LCD (default)*. Choose *Middle Centre of Screen*.

**Note:** Choosing to Calcheck only the middle centre is normal for most Softproofing purposes. If you have a suitable high-end graphics monitor, you may wish to select the *3 x 3 grid* option and Calcheck all areas of the monitor.

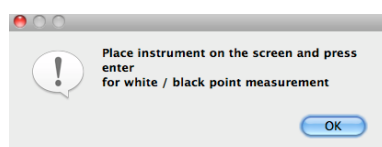
5. Hit the Measure button. Choose the Calcheck Chart - *Newspaper* - from the pop-up then click OK.
6. Follow the onscreen instructions for your instrument to begin display calibration.



For the i1 Pro, first:

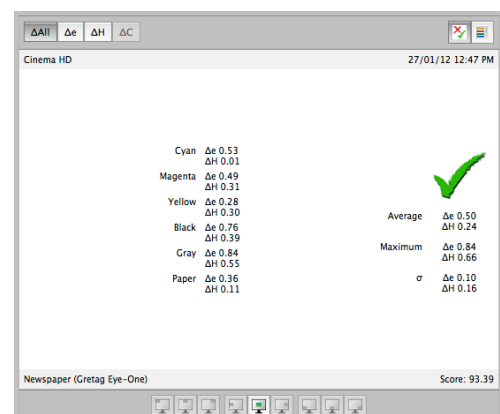


then:



When the Spectrophotometer has finished taking Calcheck measurements, the Calcheck Summary results will be displayed.

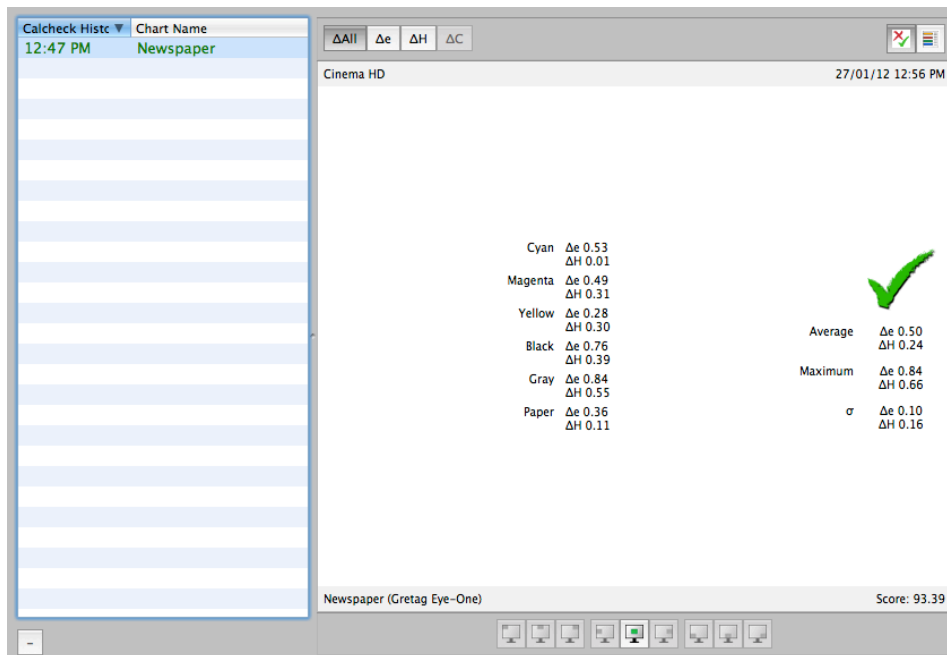
To view details of individual patch measurements, click the Details button (top right).



## Passing Calcheck

If the display passes a Calcheck as denoted by a green tick, then it is now ready for colour accurate proofing.

The latest (current) Calcheck results are now viewable in the Calcheck summary. Previous Calchecks can be viewed in summary the History menu option and in detail by selecting the monitor name below History.



## Failing Calcheck

If the display fails Calcheck possible reasons include:

### ***Brightness, White Point or Gamma settings***

If a few the Calcheck patches fail or the  $\Delta e$  /  $\Delta H$ 's are up near the edge of tolerances, it may be that all is required is to adjust the brightness, white point, and possibly the gamma settings of the display.

Calibrate the monitor again, as per the guide above, after adjusting the brightness and/or white point of the monitor. Save and assign the created ICC profile, then try Calchecking again. Try higher and lower brightness and white point until the monitor passes Calcheck. Note, a Gamma setting of 2.2 is almost always the correct setting for current monitors and graphic cards.

### ***Spectrophotometer Error***

If the measured Calcheck results for any or all patches are marked different from the reference values, e.g. Cyan  $\Delta e$  of 50.00, it is possible the spectrophotometer has read the patches incorrectly or that it didn't initialise properly.

Check the instrument is calibrated correctly at the start of the measuring process and that spectrophotometer is sitting flush with the monitor when measuring.

### ***Display is not capable of reproducing the gamut defined in the Press ICC Profile***

In this case, you may find that while many patches pass calcheck, some parts of the ICC gamut (patches), such as Cyan or Magenta will fail.

e.g.  $\Delta e$  summary numbers that indicate the monitor may be appropriate to purpose might look like this:-

$\Delta$ Cyan	12.70
$\Delta$ Magenta	9.20
$\Delta$ Yellow	2.10
$\Delta$ Black	1.70
$\Delta$ Gray	2.00
$\Delta$ Paper	1.20

Not all displays are capable of displaying the full gamut of a press (print) colour space. While many monitors are able to reproduce a newspaper gamut, only higher-end graphic monitors can reproduce an ISO offset press gamut.