

sRGB Colour Space, Tagged and Untagged Image Files

The terms 'tagged', 'untagged' and 'profile' as they relate to image files, can be confusing.

The full explanation is long and a bit messy.

The short explanation... there is none.

First

- An untagged image has NO embedded colour profile.
- An untagged image still has red, green and blue colour values for each pixel, but the program that is trying to read these numbers has no idea of what colour value it should assign to them.
- The colour profile is the mapping that determines what colour each RGB value equates to.
- A tagged image HAS an embedded colour profile, of some sort.
- An untagged image can still be an RGB – it is in colour after all.
- An untagged image has no embedded information as to what colour space the image belongs in. When displayed, it is a 'best guess' by the hardware and software.

Because an untagged image has no hint as to what profile should be used for the RGB values when it is being interpreted by the editing program, display software or display device, someone or something has to make a guess. The common convention (as used on all Windows based PC's, - *Macs treat them a little differently*, Web pages and in competitions such as those run by VAPS), is to assume the sRGB profile. If the display software being used doesn't do anything with profiles, it will assume the RGB values can be sent to the display unmodified, and because a properly calibrated display is very similar in behaviour (please note the correct English spelling) to sRGB, it will effectively be assuming the image is in sRGB. The very latest LCD monitors by default are adjusted in the factory to closely resemble the sRGB colour space. Earlier LCD's and all CRT monitors were not and might even display an image like something from another planet, if left un-calibrated.

Consequently, if you save an image in a different profile (e.g. Adobe RGB) as an untagged file, the RGB values will be used to display colours different to those you saw when authoring the image, i.e. the same number values for the colours that were saved in the file will actually produce different colours, on an un-calibrated system, the difference may be subtle in some areas, but they will still be different.

If an image is 'converted' to sRGB from another colour space, the sRGB colour space is embedded with the image. If it is then saved normally, the image becomes 'tagged'.

Whether or not the image is tagged, if the image is saved using Photoshop's Save for Web function, all metadata, tags and profiles are stripped from the image and it becomes an untagged file, which is also why this file is smaller than the same image 'saved' via the normal File/Save or /Save As functions.

Adobe RGB is not the only colour space 'serious' Photoshop workers use. People who work at the more fastidious end of the colour management 'quality tree', mostly work in the Adobe RGB colour space, but many who are at the highly professional (fanatical!) end (eg: Les Walkling and Joseph Holmes), often use much larger spaces, like the Kodak Ekta Pro colour space, the widest colour space known to Photoshop). They ONLY convert the image to another (lesser) colour space when required, at the end of their processes and to suit the specific output media (printer/another person's computer/monitor/projector/etc).

VAPS Competition Digital Image Files – The Rules

The files should be RGB. This is to ensure that the image can be shown/seen in full glorious colour (or mono) when using appropriate display hardware (PC monitor or projector).

The only other alternative is Greyscale/Monochrome, which is an option you should NOT select. Hence, whether the image is colour or mono, it still should be saved in the RGB mode.

The image file needs to be saved in the sRGB colour space to ensure it will be displayed with the 'proper' or intended range of colours and tones (or as close as a system can deliver). On a calibrated system, these tone ranges will more closely reflect those in the original image.

To provide for a further level of consistency for all entrants and judges, images must also be saved as 8-bit JPEG files. If you are in the habit of working with larger bit-depth images, they will need to be reduced to 8-bit before saving. The Save for Web function does this anyway.

If an image has been edited in another colour space (eg: Adobe RGB) then it must first be Converted to sRGB (using Photoshop's commands - Edit/Convert to Profile/Destination Space/Profile-sRGB), before being saved as the file for competition.

Using this method will save the file in the sRGB colour space with an embedded profile – making it a TAGGED file, which is OK.

To Save an Edited Image as an Untagged File

After it has been converted to sRGB, the same file can be saved as an untagged file by using the Photoshop Save for Web function. While in this dialogue, the image pixel size can be changed to suit the specifications in the rules by using the Image Size option box. Don't forget to click on Apply before continuing.

The final file size can also be optimized while still in the Save for Web dialogue, by clicking on the circled menu arrow above the Optimized check box, selecting "Optimize to File Size...", typing in 250 in the Desired File Size box then clicking OK. This will determine the best compression ratio for the file when saving and will ensure that the final saved file will be somewhere near the max. size as stated in the rules.

Remember, in CS3, UNCHECK the ICC Profile box to save as UNtagged.

The more experienced and 'perfectionist' workers will most likely NOT be working in sRGB colour space, so will need to CONVERT the image from whatever their working space is (eg: Kodak Ekta Pro, Adobe RGB, etc, and there are a myriad of them to use/chose from). These people know what this means and will comply without giving it any thought. The less experienced will probably not know what all this means and therefore will mostly likely not be using any of them anyway.

By default, digital cameras when purchased (unless someone at the shop has fiddled with the setup), are set to the sRGB color space.

By default, Photoshop and most other image editing programs, are set to the sRGB color space. If the user has not altered the Colour Space Preferences, apart from checking, no further action is necessary.

BUT

If the worker is a discerning photographer, the camera setup will most likely have been changed to Adobe RGB colour space and Photoshop has also had its preferences changed to Adobe RGB, or some other preferred option.

Hence, when an image is edited by Photoshop by the discerning worker, it will either be opened with Adobe RGB colour space already embedded in the image, (because the camera was set to Adobe RGB), or if the image will come in with another profile embedded (or none), the worker will agree to the dialogue box option that pops up and Convert the file to the current Photoshop working space (of Adobe RGB, because that will be the default Photoshop space as set by the worker through the Colour Management Preferences options).

If you have your Colour Management Preferences set to Preserve Embedded profiles (as you should), and the 'Ask when opening' boxes are checked (as they should be), you may not see the dialogue when opening an image with a profile that is different to your working space.

Bottom Line

- If your camera is set to sRGB and Photoshop is setup with the sRGB colour space, then when you edit an image in Photoshop and save it normally, it will be embedded with the sRGB colour space profile and it will be a TAGGED file.
- If you use the Save for Web option to save the same image, it will still be in the sRGB colour space but it will be an UNTAGGED file.
- If you convert an sRGB image to Adobe RGB while working in Photoshop and save it like that, it will be a TAGGED file with the Adobe RGB colour space.
- If you use the Save for Web option to save the Adobe RGB file from Photoshop CS2 or earlier, it will still be in the Adobe RGB space, but untagged .
- Strange but true... for CS2 and earlier versions of Photoshop, even if the ICC Profile box is checked in the Save for Web function, tests have shown that it still DOES NOT embed a profile (this is a 'undocumented' bug – see references below).
- If you use the Save for Web option in Photoshop CS3 to save the Adobe RGB file, it will be converted to sRGB if you select the "Convert to sRGB" option (just under "Optimize to File Size...") and will only be TAGGED if you select the "ICC Profile" checkbox.
- In all cases, if you save an image using the Save for Web function, the image will be saved as an 8-bit image file.

Recommendations:

- You should calibrate and profile your monitor regularly so that colours will look the same as on everyone else's (calibrated) monitors/printers.
- When your image is ready for resizing/profiling and saving, make a new copy (you'll have to shrink large originals down to fit the 1024x768-pixel limit and won't want to overwrite your original by accident).
- If your image copy is not already in sRGB when you come to save it, use Photoshop's "Edit/Convert to Profile..." function to convert it to sRGB. The colours in the image should not change significantly, but the numeric values in the file will change to the sRGB standard. Actually, you can flatten AND convert an image in one go with the Convert function, just tick the 'Flatten image' check box.
- To avoid confusion, you should save the images for competitions tagged with the profile (check "Embed Color Profile" in the Save As dialog, or "ICC Profile" in the Save for Web dialog). The sRGB profile will only add 4kB to the file size.

References:

<http://www.gballard.net/psd/assignconvert.html> - go here first – less convoluted. Also has some interesting remarks about a bug in Photoshop that saves an image as untagged even when the ICC Profile option is checked.

<http://www.earthboundlight.com/phototips/untagged-rgb.html> - a myriad of links and cross references, lots of target images, confusing but stick with it and delve all they way in/across. Eventually you will find some pages from which you can download some great monitor and printer calibration target images (for Mac & PC). I'm not sure how he gets around the copyright issues of these targets, but he does include references to the original owners/creators, so I am sure it's OK.