



Evaluation Release : Color Management in TOPAZ Rip

Date : 28st Jan. 2005
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This letter is prepared to help understanding of our Evaluators who are not very familiar with TOPAZ Rip yet.

Differentiated concept of TOPAZ Rip

1. TOPAZ Rip's CMS is designed for max. freedom in color control
TOPAZ Rip is not dependent on ICC profiles. This means that ICC profile itself is just a part of TOPAZ CMS structure. TOPAZ CMS is putting more weight on variety of color control within the maximized color gamut secured.
Most of people agree that generally ICC profile makes output colors muted and dimmed. This will cause critical problem in photographs, fine arts, posters, banners and POP signs. Also it is a kind of tedious work if you should create ICC profiles each time of every printing jobs, because printing conditions like media, ink, machine, resolution, screen and other options are changeable every time.
TOPAZ Rip helps users to manage various TCM (Topaz Color Management) files from minimum numbers of basic ICC profiles in a very easy and practical way.

2. TOPAZ Rip is independent to "PS interpretation engine".
All other Rips are very relying on PS engine. This generates various problems in general.
-Too relying on ICC profiles.
Basically, color is downgraded when using ICC profiles, because color gamut is narrowly limited.
-Limitation in Color correction.
Other tips need to rely on ICC profiles and gamma, saturation, level and brightness corrections are screened by ICC profiles, which gives confusing results. For example, if you'd like to decrease 10% of Cyan, you'll see 5% increased yellow on the print output unexpectedly.
-Limitation in printing size.
Other rips are relying on the PS interpret engine and the engine has limitation of pixel treatment. Also those rips requires spare memory of free hard disk for file treatment.
In this regards, many rips have limitation of printing size, like max. 10m or 15m... and even they can support long print output, it'll require too much time and memory, like 5G, 10G, 20G...

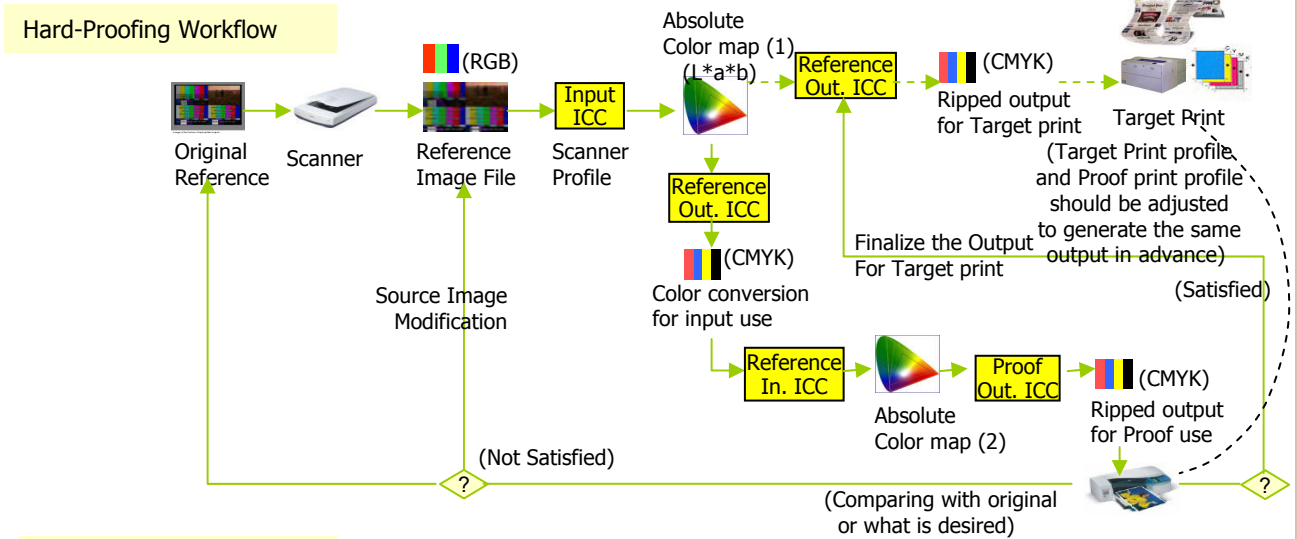
TOPAZ Rip is using ICC profile as a basement of CMS and it does not rely on ICC.
So people can adjust colors to what they expected exactly.
(In this purpose, they need to make ICC profiles as larger color gamut, by setting total ink limit above 300%. Real setting of total ink limit can be adjusted in Topaz CMS module when linearization in TCM making.)

TopazRip enables real Rip&Print on the fly. Some Rips argue they can do it, but actually they can treat just image files (not PS or PDF) only on Rip&Print on the fly. TOPAZ Rip has no limitation in file size and print output size. Even 100M long printing can be possible, without overload in memory and cpu. TopazRip requires max. 3G of free hard disk only, even how long the file or printing size is.

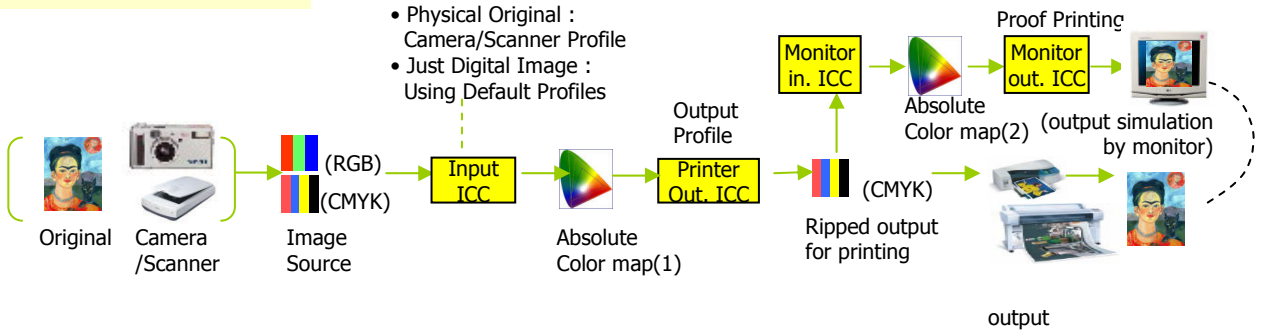
This option is very useful when nesting (media saving). Nesting module is under development and will be completed until the end of Feb. Other rips do nesting but those are 'after-ripping' nesting. This is not useful in large format printing of Signage market. Just imagine. Nested big rasterized file need to be printed at once. It'll require huge time and load of memory and cpu. TopazNesting is using PS information directly and it Rip&print the nested layout on the fly, without overload.

General procedure of CMS in Raster Image Processor

A. Match-Proofing Workflow

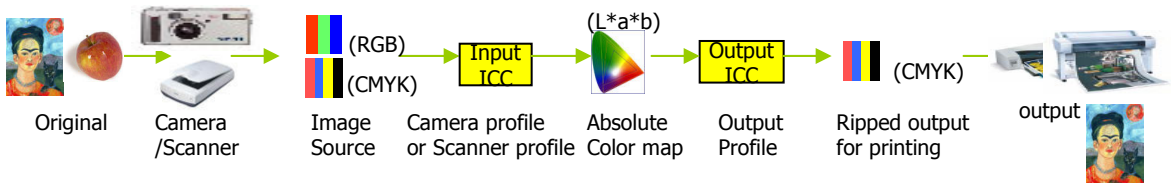


Soft-proofing Workflow

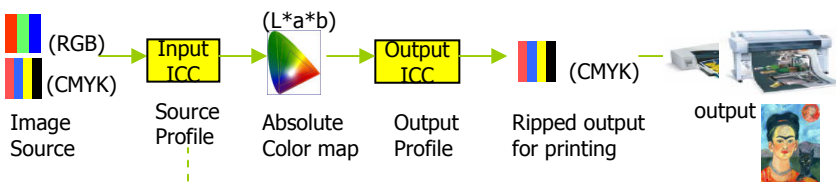


B. Pleasant Color Printing Workflow

Color printing from physical original source



Color printing from Digital Image

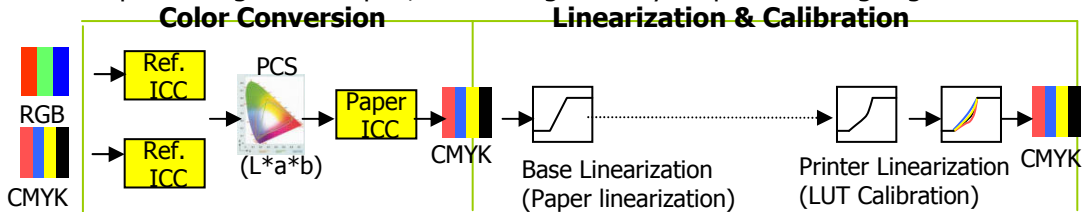


CMYK Input Profile: US Web Coated SWOP, TOYO, DIC, Euro and etc
 RGB Input Profile: AdobeRGB, AppleRGB, ColormatchRGB, sRGB, Digital Colorhub and etc.

Different CMS processes in comparison between different Rips

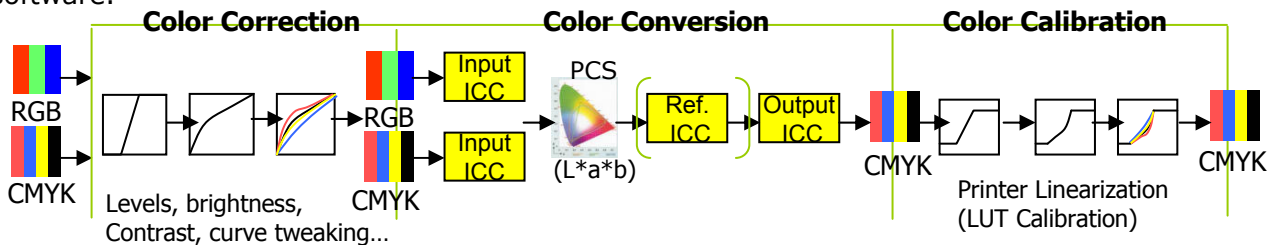
1. Proofing Rip like BestColor

- Relying on ICC profiles strongly
- If base linearization and base/reference ICC profile does not exactly match with current environment, there's little way of modification of color settings, without re-linearization and re-profiling.
- Suitable for proofing market only, with setting up of professional densitometer and profiler.
- Cannot print on various kind of media like fabric, flex and others for signage market, due to lack of functions for Vivid (Pleasant) color.
- Cannot print long size output, which is generally required in Signage market.



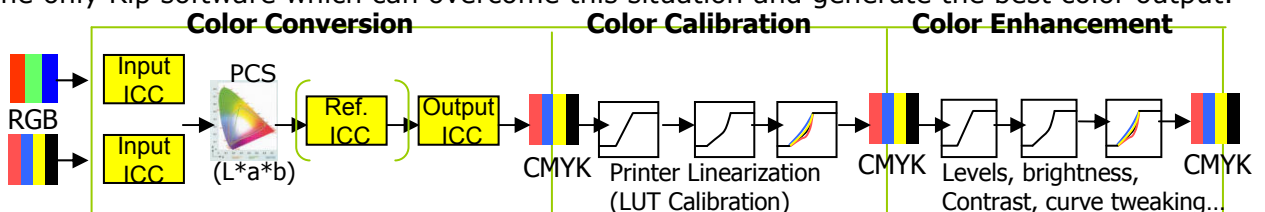
2. General Rip like Onyx and Wasatch

- Relying on ICC profiles relatively
- Trying to pack a bunch of unrelated add-on features for cutting, digital textile printing, screen printing, etc as well as CMS tools.
- If ICC profile does not exactly match with current environment, you need to do re-linearization and re-profiling even if they provide some color correction tools.
- Color correction tools exist 'in front of' color conversion. This means user's setting of color correction goes through black box of ICC conversion and users cannot exactly simulate the colors in print output. (Ex. Setting of 10% increase of Cyan will not exactly applied to the print output.)
- Some rips like Scanvec's photoprint forces users to use their proprietary profiling utility only, without providing open architecture strategy for allowing users to use any Color Management software.



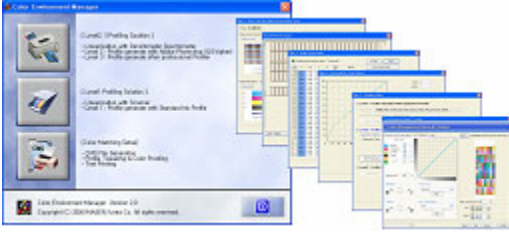
3. Topaz Rip

- Does not rely on ICC profiles. (Even it is possible to print without ICC profiles)
- Trying to get max. freedom of color correction and enhancement without being limited by narrow gamut of ICC profile itself. But you need to remember to create ICC with total ink limit above 300% to secure larger color gamut.
- User can expect the exact application of their color corrections on real print output, because TOPAZ Rip is treating with color corrections and screens independently from ICC profiles. TOPAZ Rip processes Color Enhancement (color correction) "over the basement of ICC conversion".
- Profile Once, Application Many : If you have similar ICC profile for the current job, you can create various CMS settings in TCM files, with freely simulating the effect of various color correction tools. This is very practical and useful for non-routine printing jobs.
- Even when total ink limit value is too low, caused by relatively poor quality of media, TOPAZ is the only Rip software which can overcome this situation and generate the best color output.



Details of Procedures of CMS in TOPAZ Rip

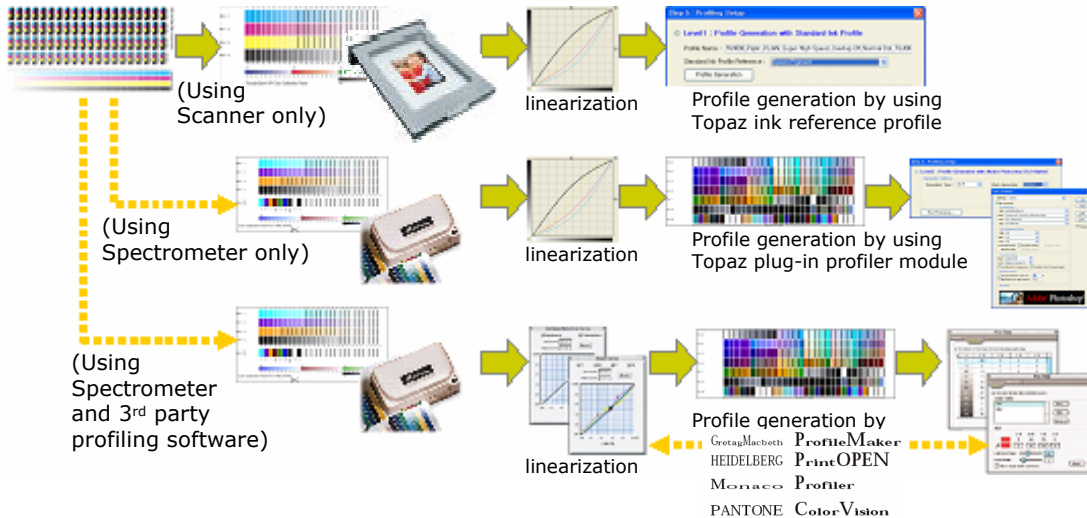
A. Overall



TOPAZ Rip has its proprietary wizard for CMS process. There're are various methods here.

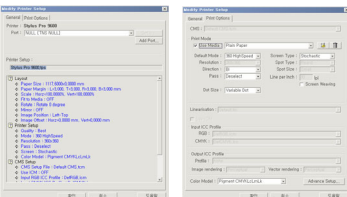
- For linearization, you can use your own 'scanner' or 'professional densitometer' like DTP41.
- For Profiling, you can use 'prepared std. profiles based on ink types : level 1', 'profiles generated from Photoshop plug-in software : Level2', or 'profiles generated from professional profiling software like PrintOpen : Level3'.

(Current version is v.8.0. Next version 9.0 will provide Topaz profiler software (ExpertMatch) to support full features of 3rd party color profiling software. After ver.9.0, there'll be 2 options of profiling – preliminary profiling and professional profiling – without using Photoshop plug-ins.)

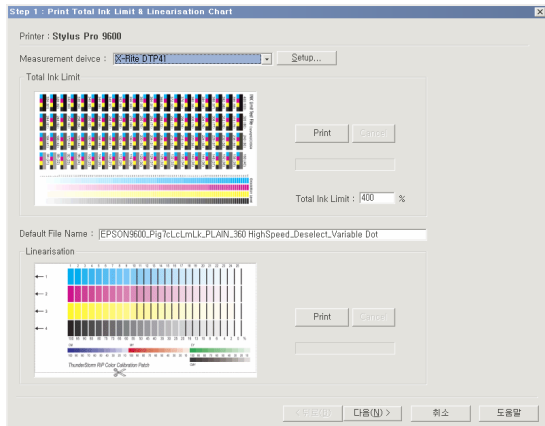


B. Linearization

If you have a densitometer or only normal scanner, you can proceed linearization process. Linearization is very important for getting the best quality of print output. When using scanner, the linearization curves can be relatively not very accurate. So this option is practical only for signage printing purpose. However, we'll update this 'linearization with normal scanner' option with providing 'scanner calibration' tool and reference color patches. This update will be available in the end of Feb. 2005 and users will be able to get more accurate results from linearization by normal scanner.



1. First of all, pls select your printer model and adjust your printer settings (media type, resolution, screen, direction, passes, dot size, lpi, color model –CMYKLcLmLkOrGr..., and etc.) .



2. Measure Total Ink Limit first.

After printing the Total Ink Limit test chart and select the max. level where the ink does not bleed. Type the value in the blank.

In practical environment in Signage printing field, there's so many media which cannot provide large value of total ink limit. It is very hard to get nice result with this kind of media with normal Rip s/w. However, Topaz Rip can deal with this kind of media even if Total Ink Limit value is too low, with providing ICC-independent flexible color management tools by which users can setup the most well-blended parameters.

3. Name your own CMS file (linearization file , ICC profile and TCM file)

You can use the provided default name. This name will be applied to TCM file automatically.

4. Print the Linearization chart.

	C	M	Y	K
100	2.313	2.211	2.110	2.410
95	2.312	2.209	2.109	2.409
90	2.310	2.208	2.109	2.309
85	2.309	2.109	2.009	2.209
80	2.209	1.909	1.909	2.109
75	2.109	1.809	1.709	2.009
70	2.009	1.759	1.609	1.909
65	1.909	1.719	1.509	1.709
60	1.809	1.659	1.409	1.609

5. Setting of DMax cut for each color.

This is the most important step in color management.

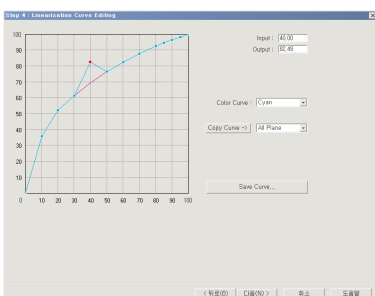
However, no other solution can provide easy or automatic way for this. We're trying to fine the best practical guide for this now.

In the DMax cut for each color levels, there's physical limit and theoretical limit.

Theoretical limit mean just a divided values from Total Ink Limit. Physical limit means the pivot point of the curve, from where the curve moves horizontally or in reverse way. You can just refer to those limits.

When you put the DMax Cut, you need to check the linearization chart with your naked eye. You'll see the difference between one level with another level in contact of each color. After assuming each DMax Cut values in your mind, pls look at Blue, Red and Green chart in the linearization curve. If you feel the Blue is not real Blue, you need to change the ratio between Cyan and Magenta. In similar way, is you feel the Green is not real green, you can change the ratio between Cyan and Yellow. This is very manual way but traditional way reliable.

In practical cases, when you're using glossy papers, you can use the same values (theoretical value automatically provided) in each Dmax Cut. If not, you're recommended to put a little lower value in Yellow than other colors. (For example, C 85%, M 85%, Y 75%, K 85%.)



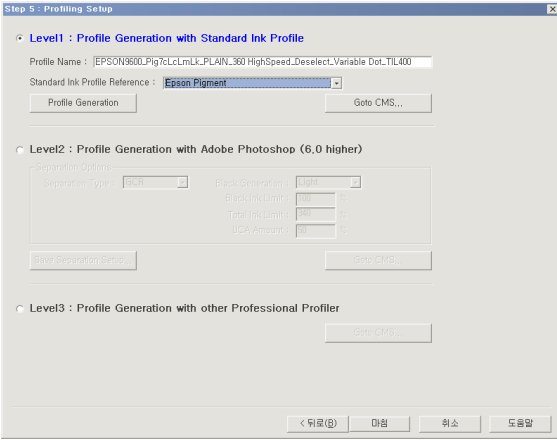
5. Confirmation of linearization curves

If there're some strange points which exceed the smooth line, due to some error from measurement devices, you can edit the curve smoothly.

C. ICC Profiling

There're 3 options for ICC profiling currently.

you can use 'prepared std. profiles based on ink types : level 1', 'profiles generated from Photoshop plug-in software : Level2', or 'profiles generated from professional profiling software like PrintOpen : Level3'.



Remember that it is very important to maintain the color gamut of ICC profile as large as possible. We recommend to create ICC profile with total ink limit value "above 300%" even though real measured value is only 220%. This will give you max. freedom in TCM settings.

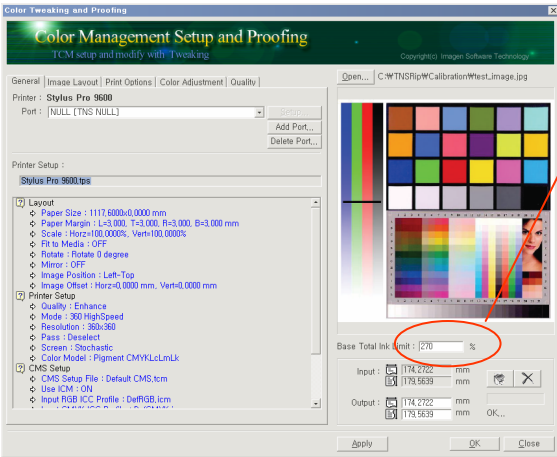
After creation of ICC profile, you can push "Go to CMS" button to generate Topaz Color Management (TCM) file, which will combine linearization, profile and additional color enhancement information together.

You can generate many different TMC files from a single ICC profile for your various kind of jobs.

D. CMS generation (TCM file : managing overall color settings)

There're 3 options for ICC profiling currently.

you can use 'prepared std. profiles based on ink types : level 1', 'profiles generated from Photoshop plug-in software : Level2', or 'profiles generated from professional profiling software like PrintOpen : Level3'.



In CMS window, you'll find the 'base total ink limit value' is set to be the value you typed in linearization process automatically. Please remember to put larger total ink limit value in ICC profiling and put real measured value in linearization and CMS processes.

You're recommended to open 'test image' to simulate the changes you're adjusting now. The preview image will present dynamic simulation in each step of your color modification settings, with you push "APPLY" button under the preview image you can print by pushing "print button" to check the real result of the current setting of each step.

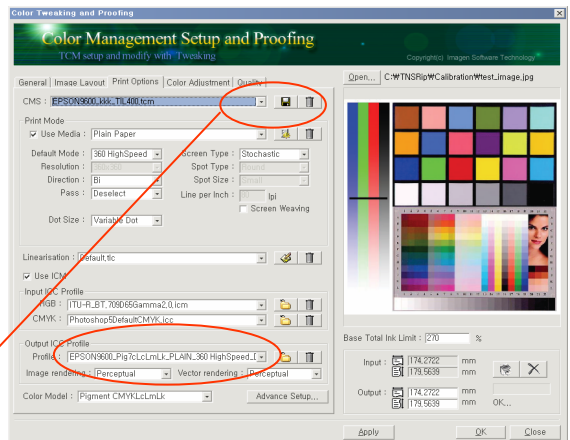
Move to "Print Option" tab.

In CMS selection box, you can select your own TCM file, automatically generated during the linearization process previously.

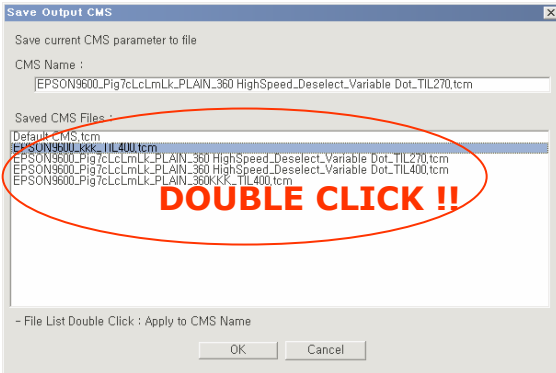
Import ICC profile.

In Output ICC profile selection box, you can select your own ICC profile created by level 1, 2 or 3 previously.

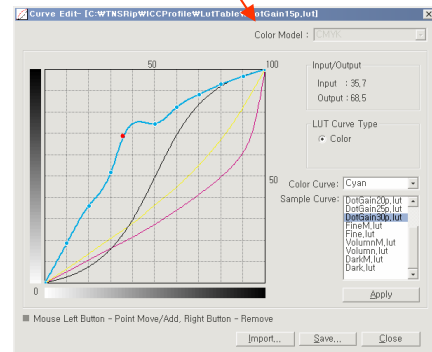
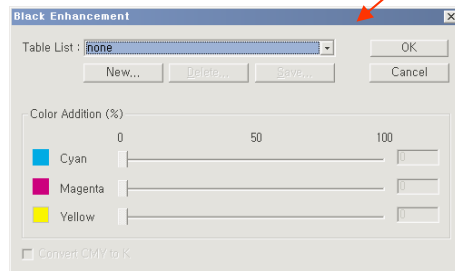
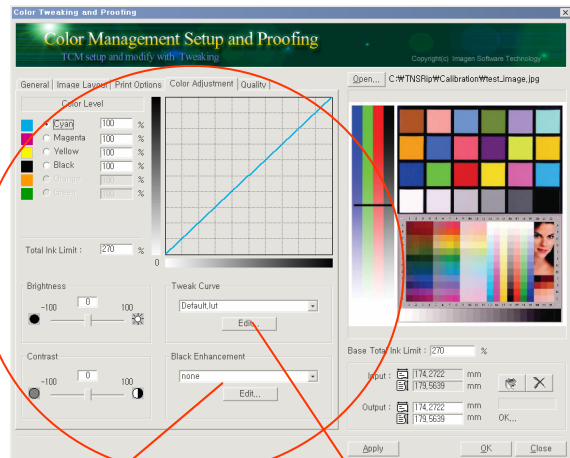
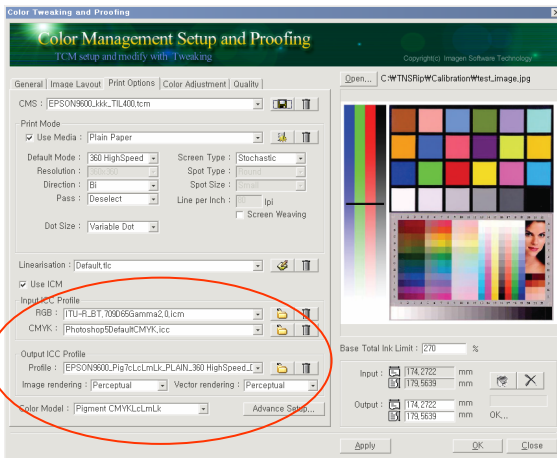
And then, push "SAVE" button of CMS (TCM file).



When you push "Save" button, below window will appear. Select the file you want in the list in lower part of the window and double-click it. You'll see changed name in the "CMS NAME" box. You can edit the name manually to create new CMS (TCM file). Press OK button to save the changed information in the selected (or created) TCM file.



Please freely change the color settings in "Print Options" tab and "Color Adjustment" tab.



Please repeat changing of settings with using various tools like brightness control, color level control, black enhancement control, contrast control and curve tweaking. Simulate the result in the monitor with preview file and printed output in each step.

You can generate the best TCM settings and save them for each required case, even though you have limited number of ICC profiles ready.