Alwan

Color Expertise

Hydra Profiling®

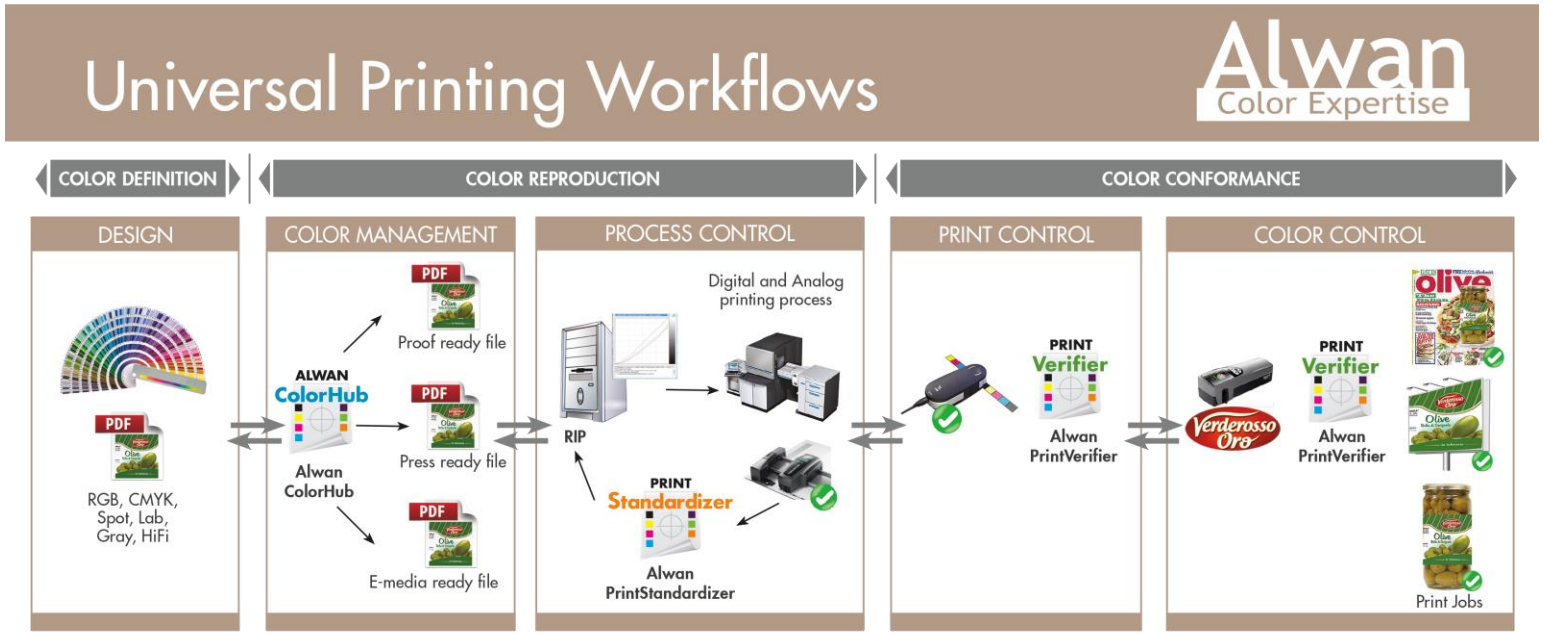
the innovative spectral profiling by Alwan

25/04/2019

Why profiling?

Universal Printing Workflows (ISO 19302)

- Color management is used to ensure that
  Reference Printing Conditions (RPC) = Actual Printing Conditions (APC)
- Process control is used to ensure that a print device's
  Actual Printing Conditions are stable

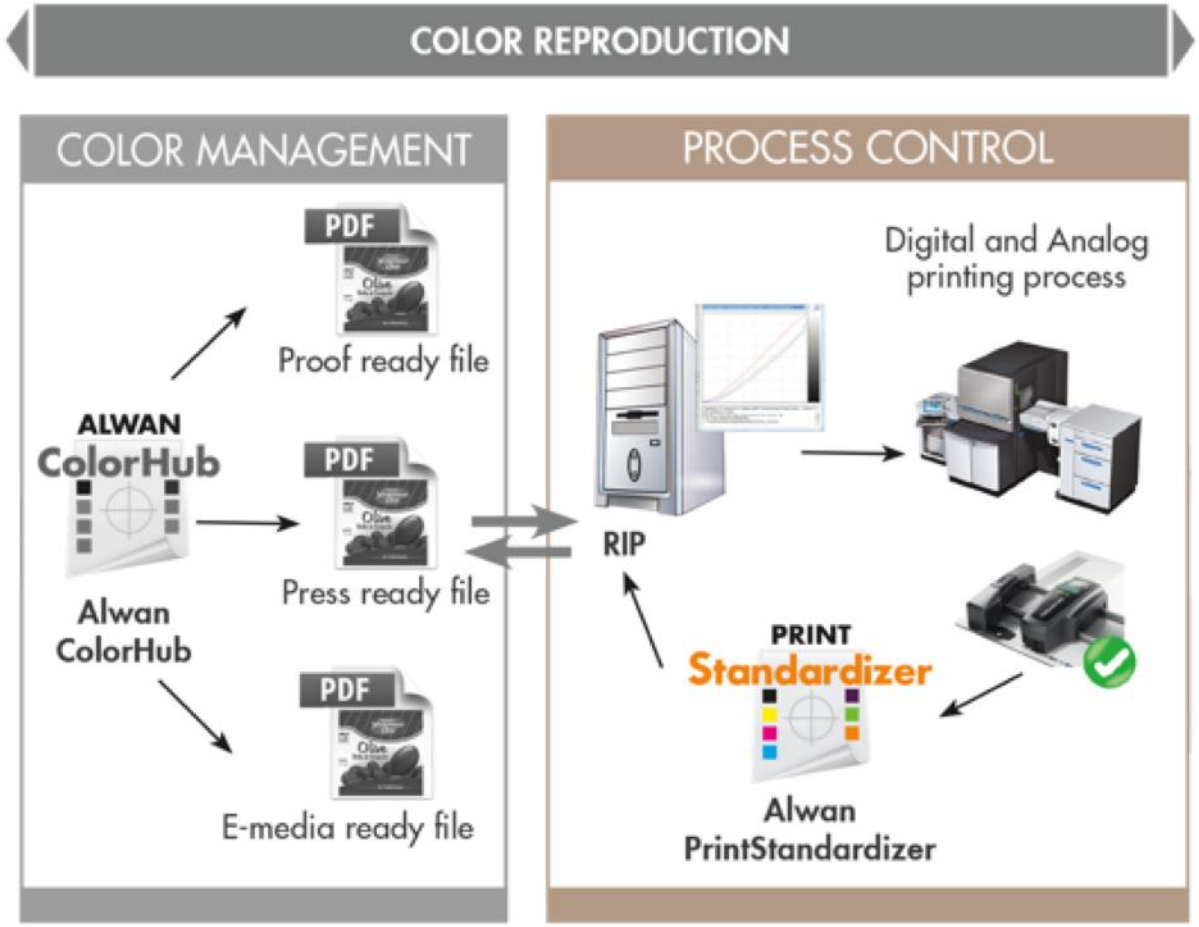


When RPC = APC?

- CMYK offset:
  - Press inks
  - Solids
  - TRC

→ Match standard printing conditions (FOGRA, IDEAlliance…)

→ **Print device profiling is not necessary**

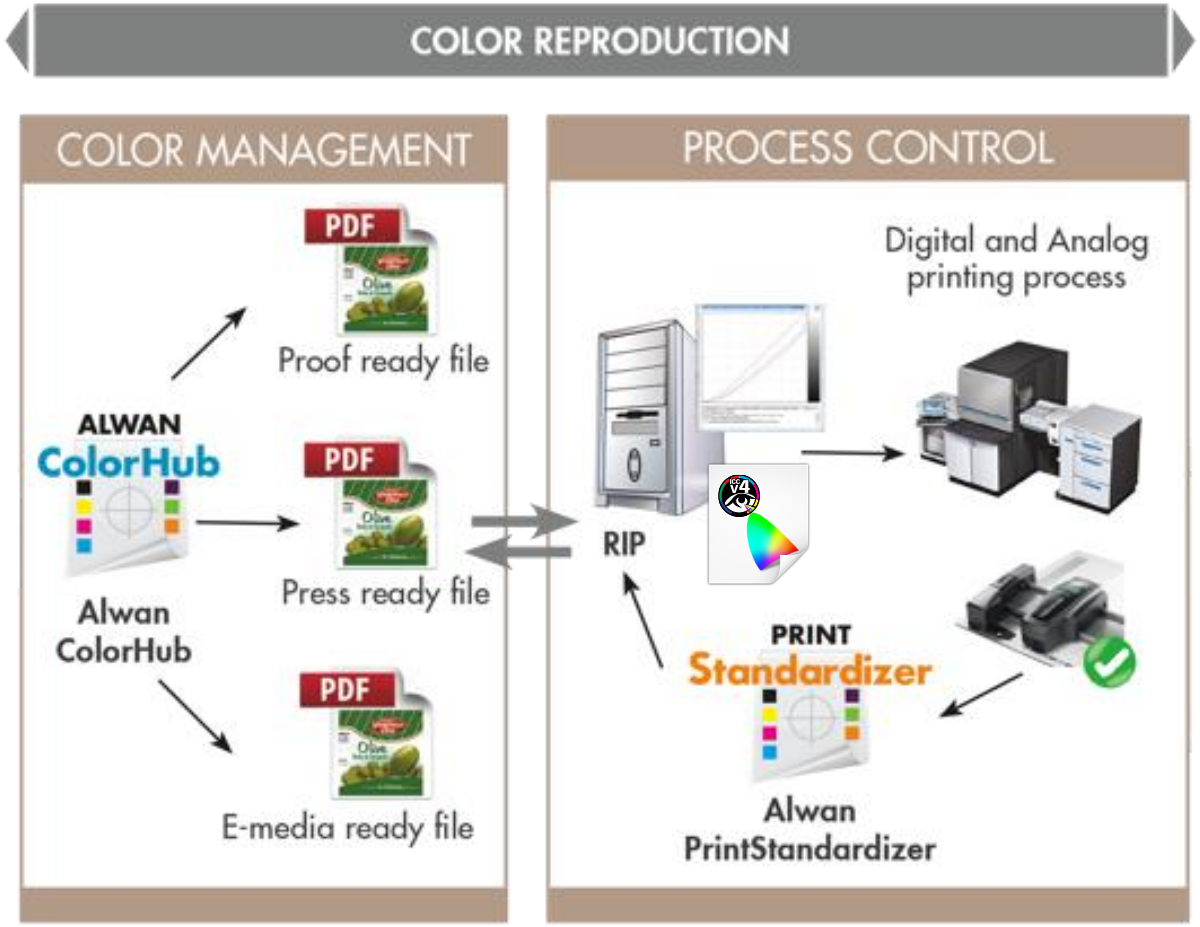


When RPC ≠ APC?

- Offset:
  - non standard printing conditions (UV, process colors, sequence, coating, custom…)
- Digital
- Flexo
- Gravure

→ No standard printing conditions

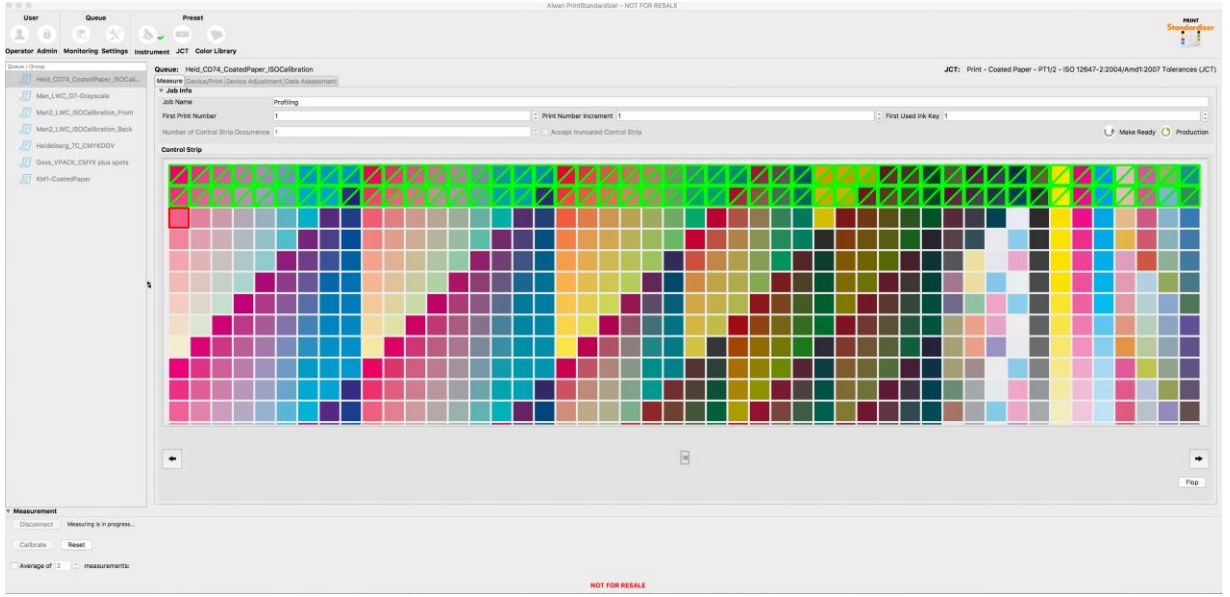
→ **Print device profiling is necessary**



Why Hydra Profiling®?

Conventional profiling

- 2-3 dedicated print sessions
  - Linear to build curves
  - Calibrated to build profile
  - Color-managed to validate profile



- **CONS**
- Technical:
  - Result does not necessarily represent production printing conditions
- Planning:
  - Press off production for 1 day
- Resources:
  - Prepress, pressroom and maintenance staff
- Financial:
  - Cost for 1 press and 1 paper = **4,000€** (Source: Deux-Ponts print shop, France)

Hydra Profiling®

- No dedicated print session
- **PROS**
- Technical:
  - Result represent production printing conditions
- Planning:
  - No machine downtime,
    measurements from production jobs
- Resources:
  - Virtually no overhead needed
- Financial:
  - Virtually no cost
    4,000€ savings pay for Hydra Profiling® of all presses, all papers
    (Source: Alwan price list July 2017, Hydra Profiling® option for APS/X)

What is Hydra Profiling®?

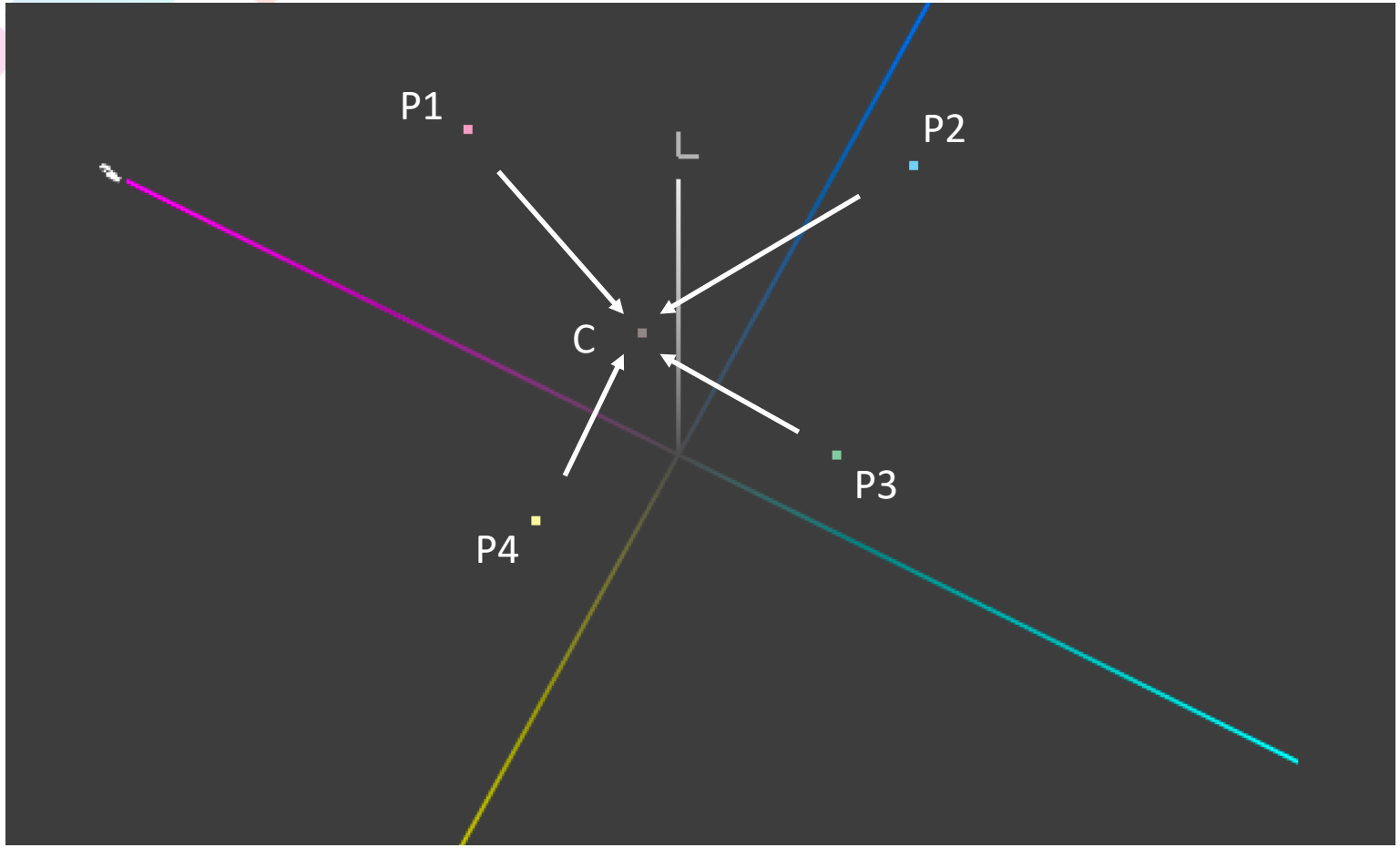
Profiling requirements

- Profile contains n-dimension tables that need to be defined
- For a CMYK device, i.e. 4 dimensions, a profile with a grid resolution of:
  - 11 points requires 11x11x11x11 = 14,641 points
  - 33 points requires 33x33x33x33 = 1,185,921 points
- For a 7-color device, i.e. 7 dimensions, a profile with a grid resolution of:
  - 11 points requires 11x11x11x11x11x11x11 = 19,487,171 points
  - 33 points requires 33x33x33x33x33x33x33 = 42,618,442,977 points

Conventional profiling

- Large number of device color space samples are printed and measured
- CIELAB mathematical interpolation is used to calculate non-printed patches
- Interpolation accuracy is directly proportional to the number of printed patches
- IT8 is the internationally recognized compromise
  (1,617 patches for CMYK process)

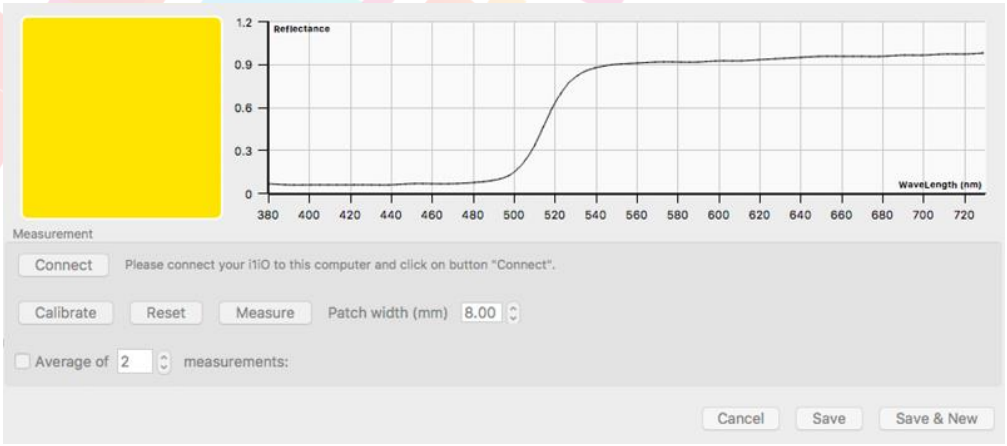
Conventional profiling



Hydra Profiling®

- Spectral modelization of physical characteristics of colorant and substrate interaction
- Spectral prediction of non-printed patches based on physics, not on math
- Large charts are not required, few patches are enough, typically 40, more for specific processes
- Accuracy is far less dependent on the number of printed patches

Hydra Profiling®



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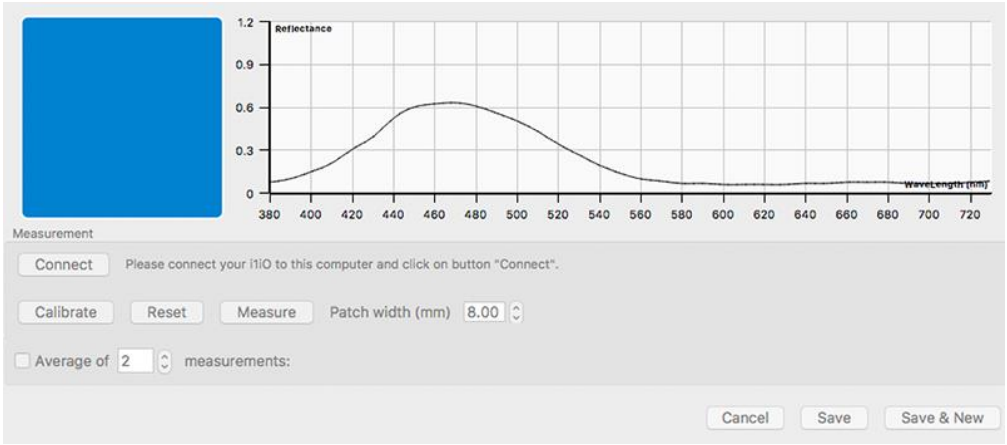

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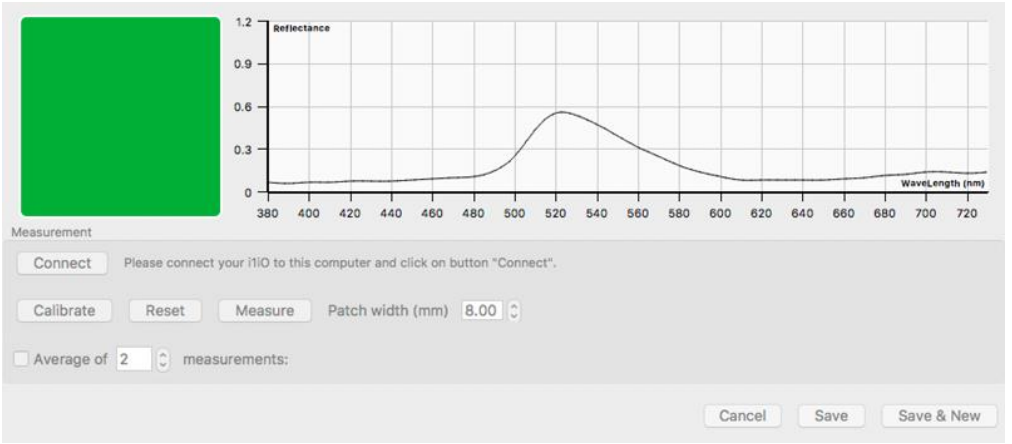
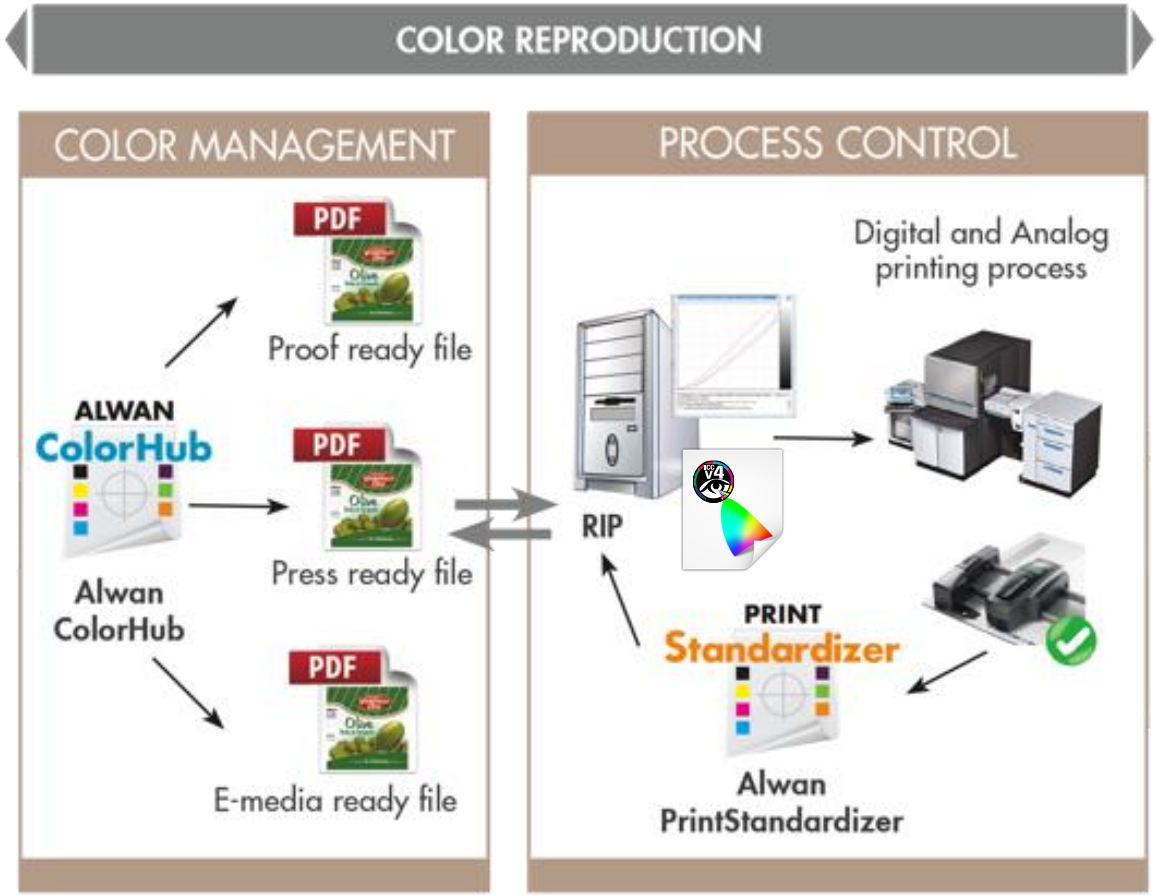
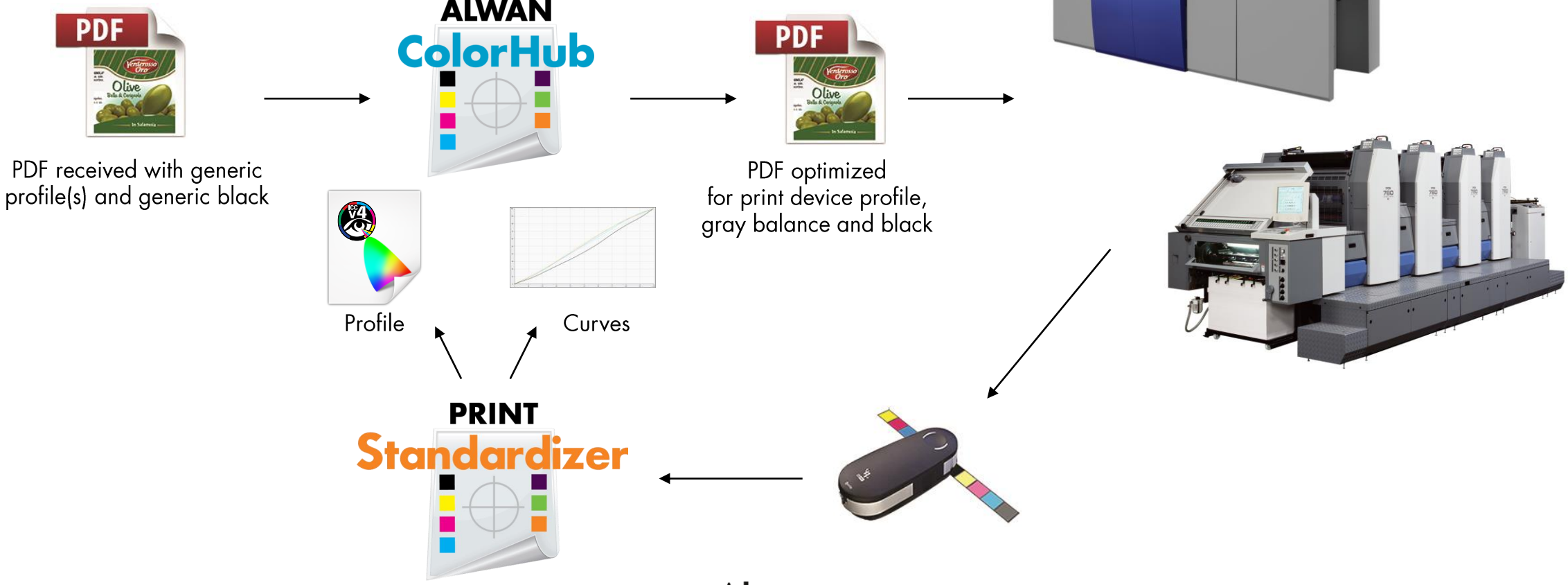


How does Hydra Profiling® work in Alwan products?

Hydra Profiling®
with Alwan products

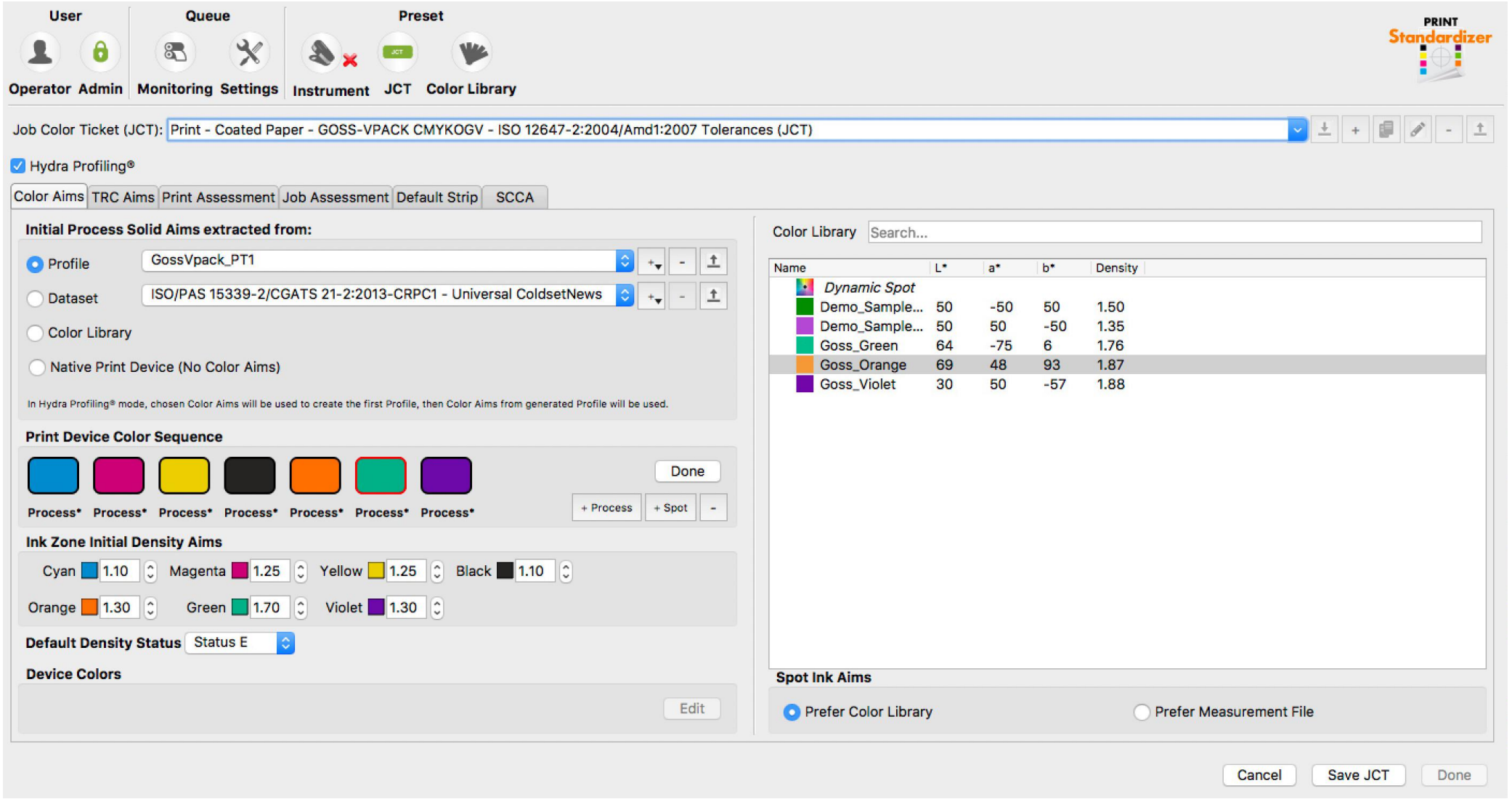


Hydra Profiling®
with Alwan products

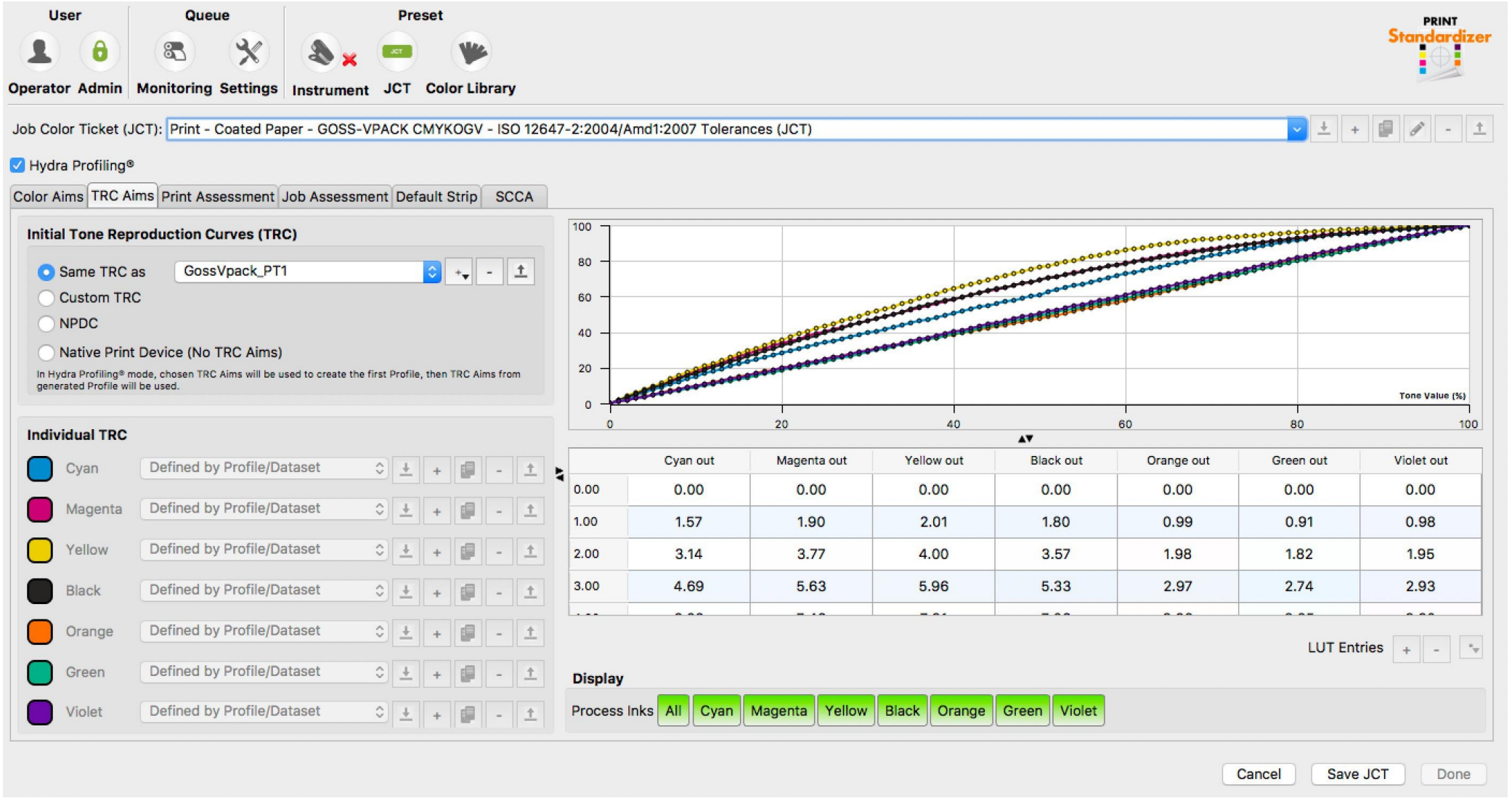


Hydra Profiling® with Alwan PrintStandardizer

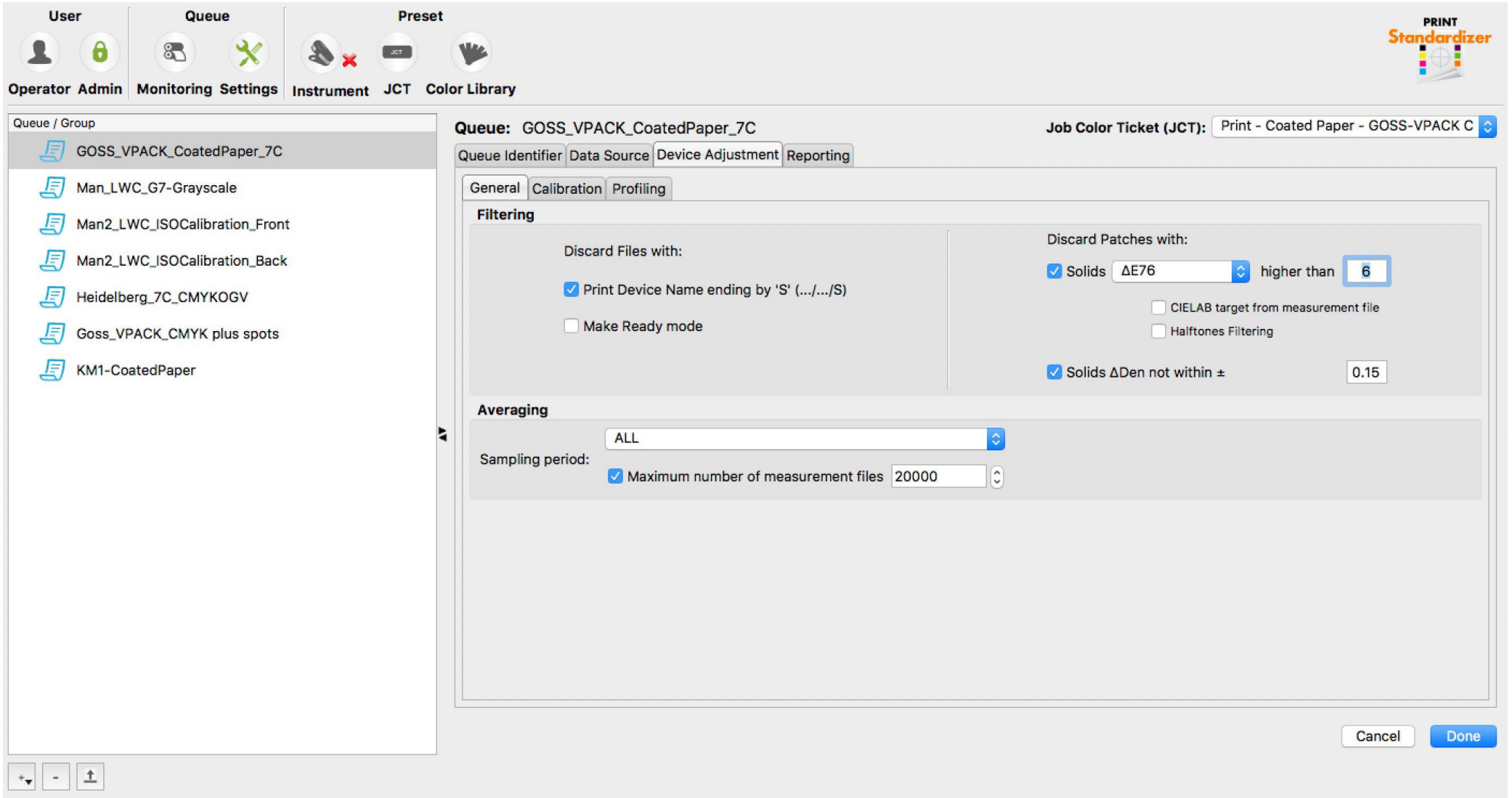
Hydra Profiling® with APS
Solid aims



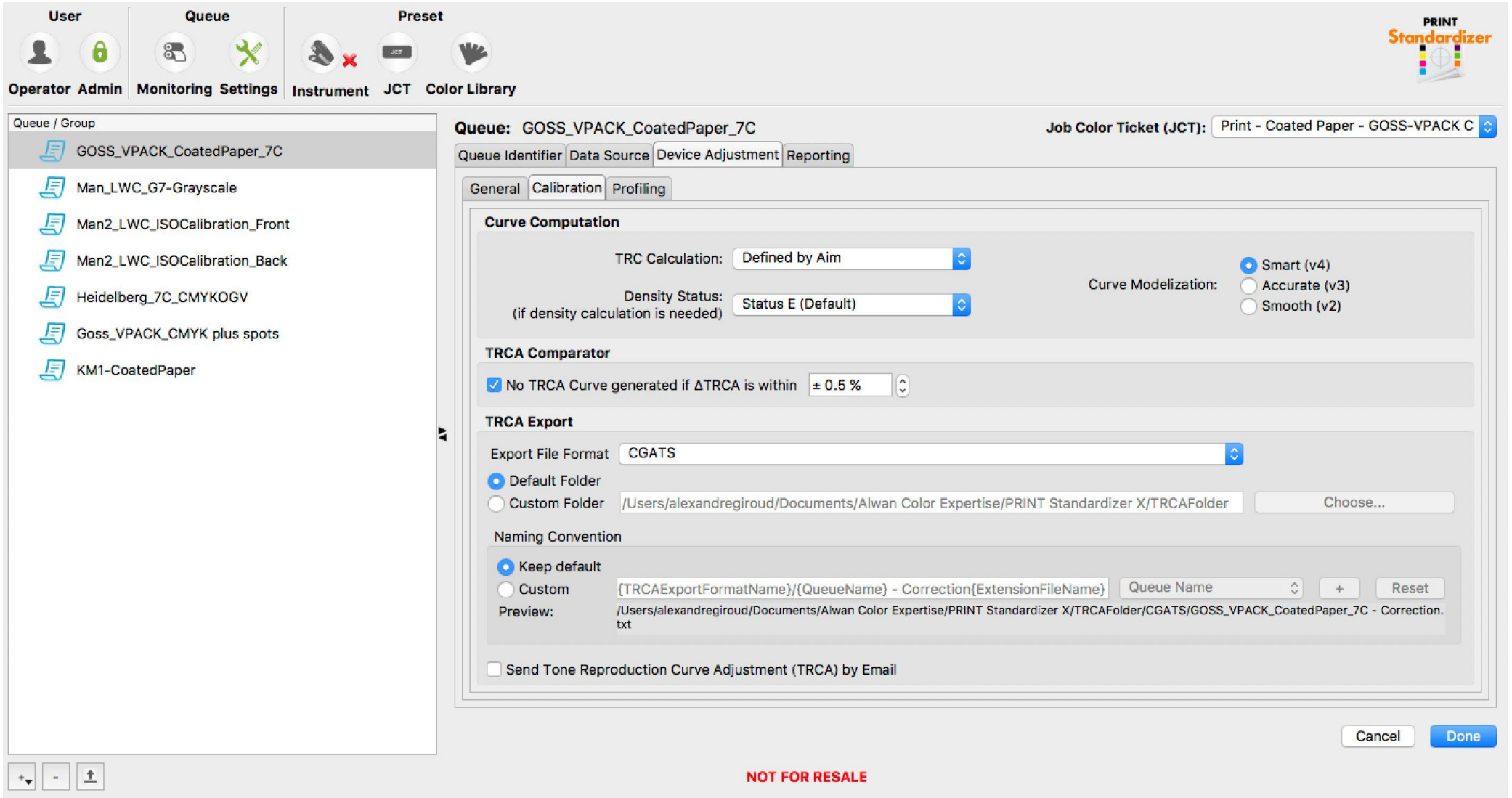
Hydra Profiling® with APS TRC aims



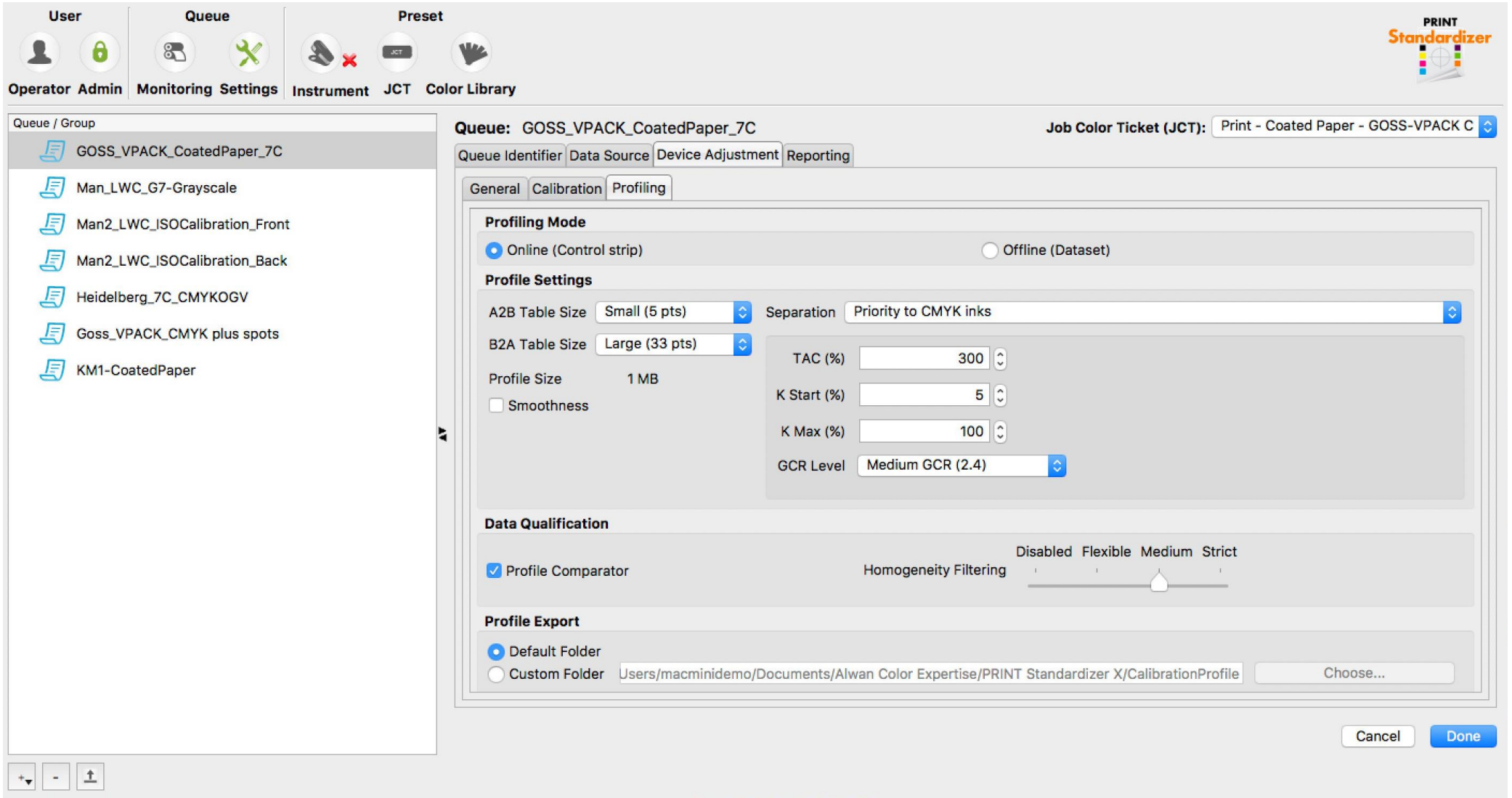
Hydra Profiling® with APS Filtering



Hydra Profiling® with APS Calibration

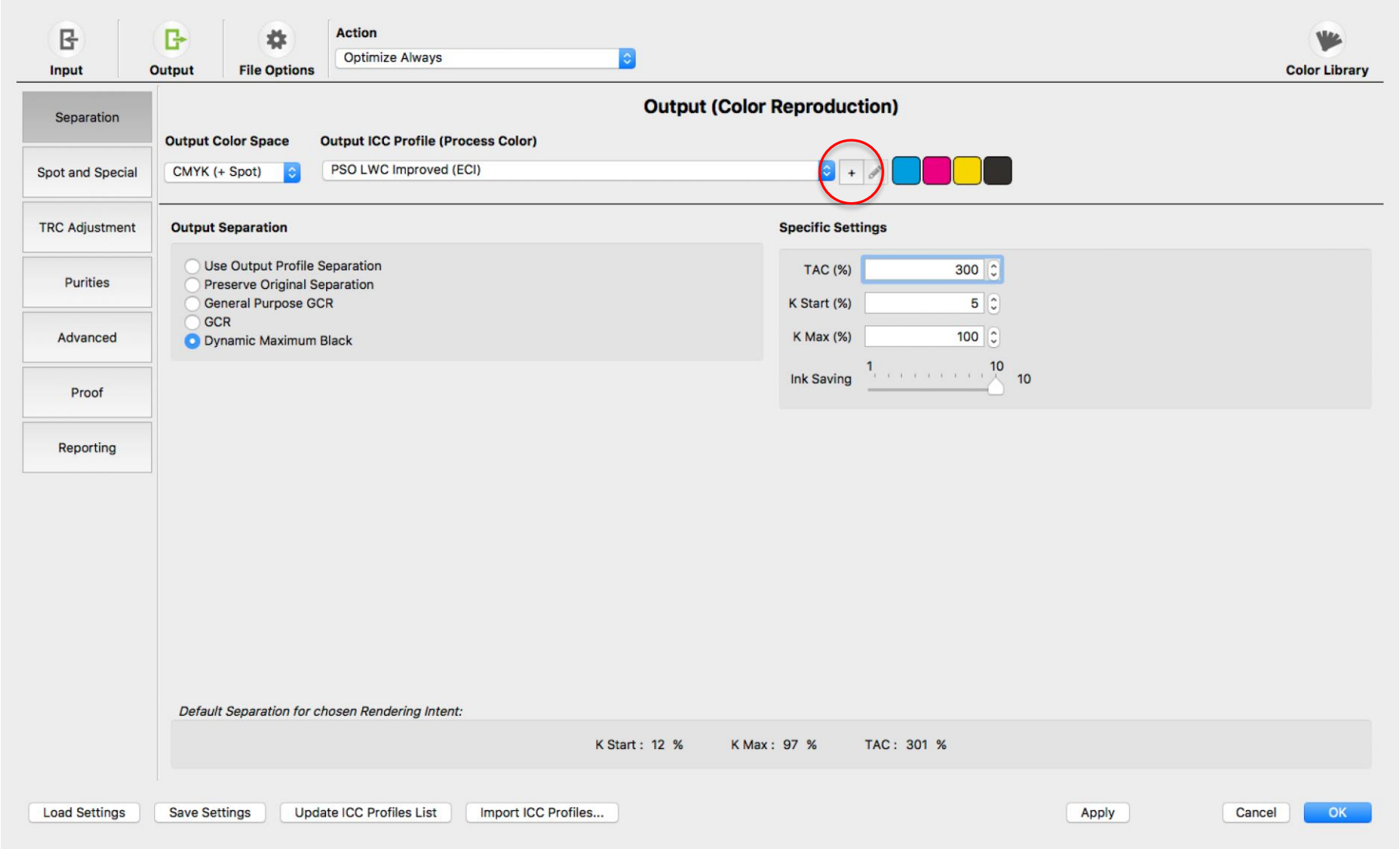


Hydra Profiling® with APS Profiling

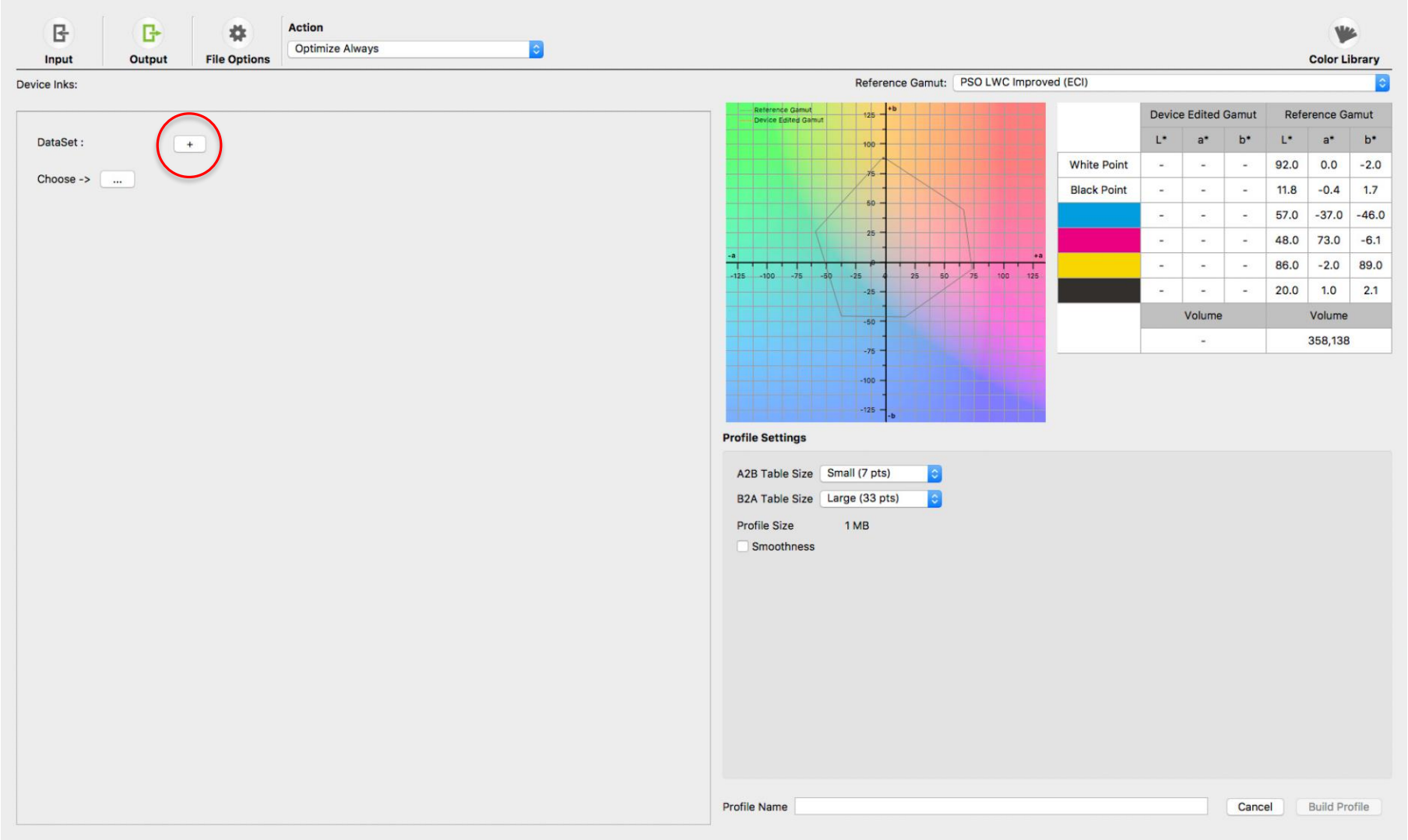


Hydra Profiling® with Alwan ColorHub

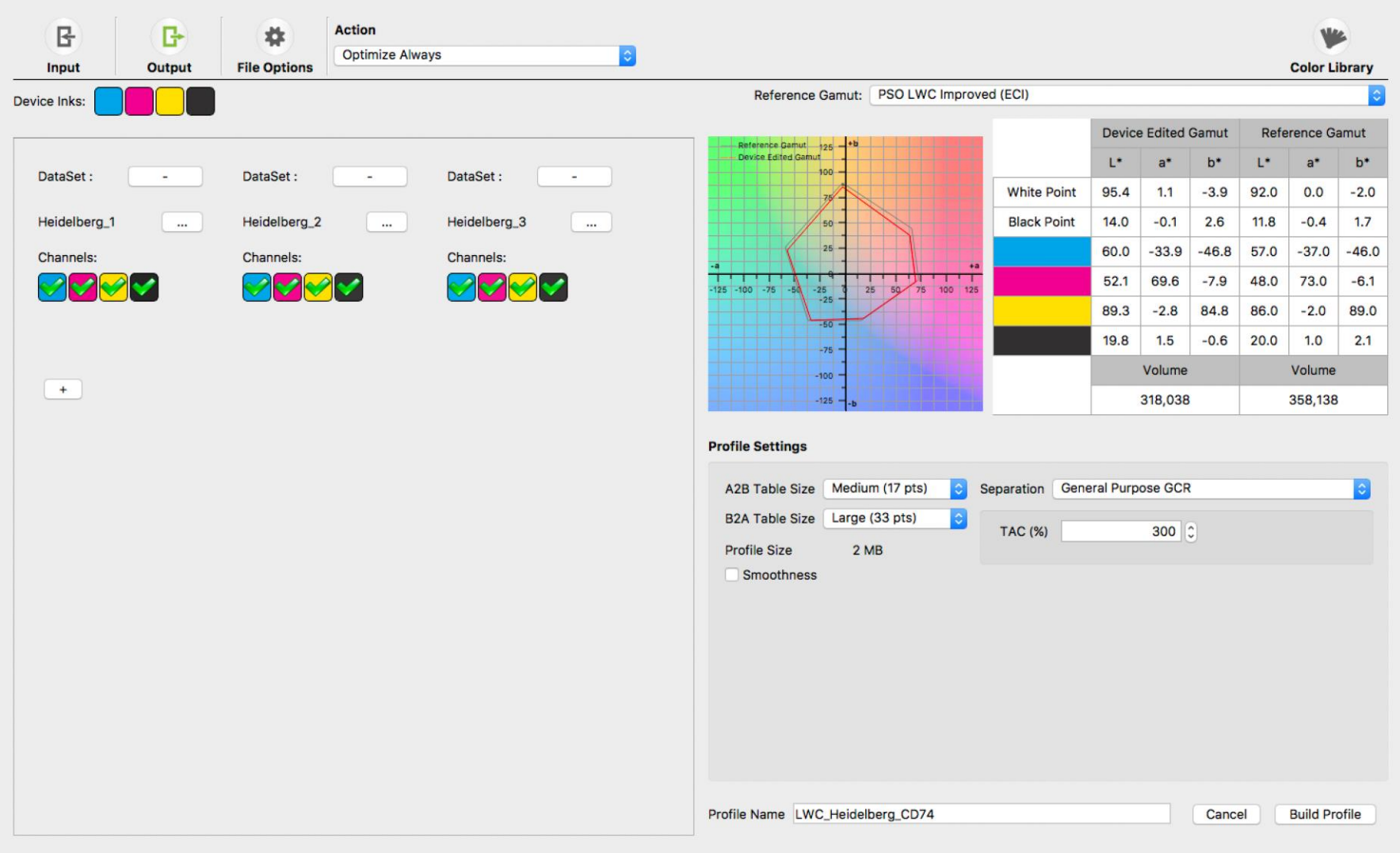
Hydra Profiling® with ACH
Building a new profile



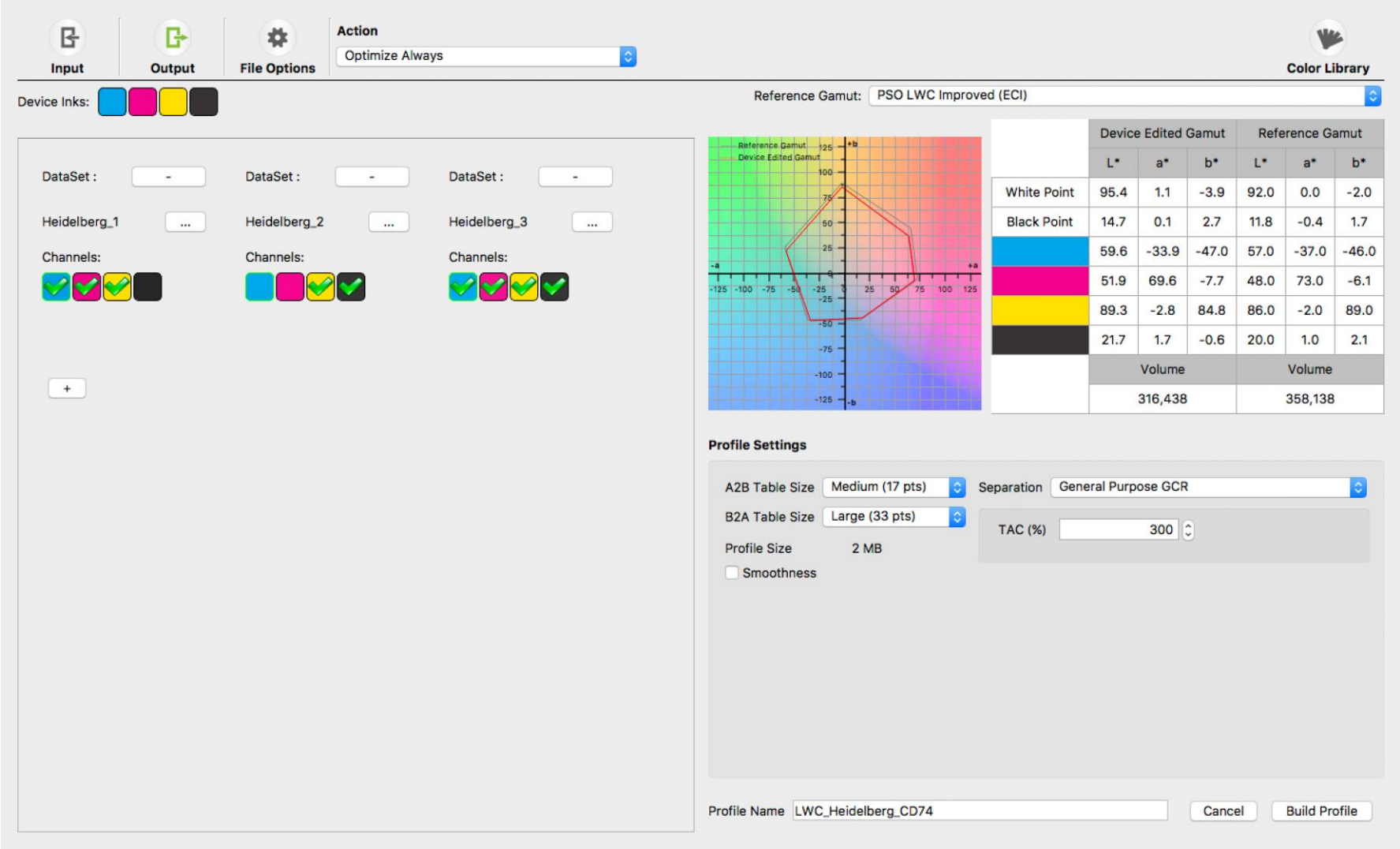
Hydra Profiling® with ACH
Import dataset



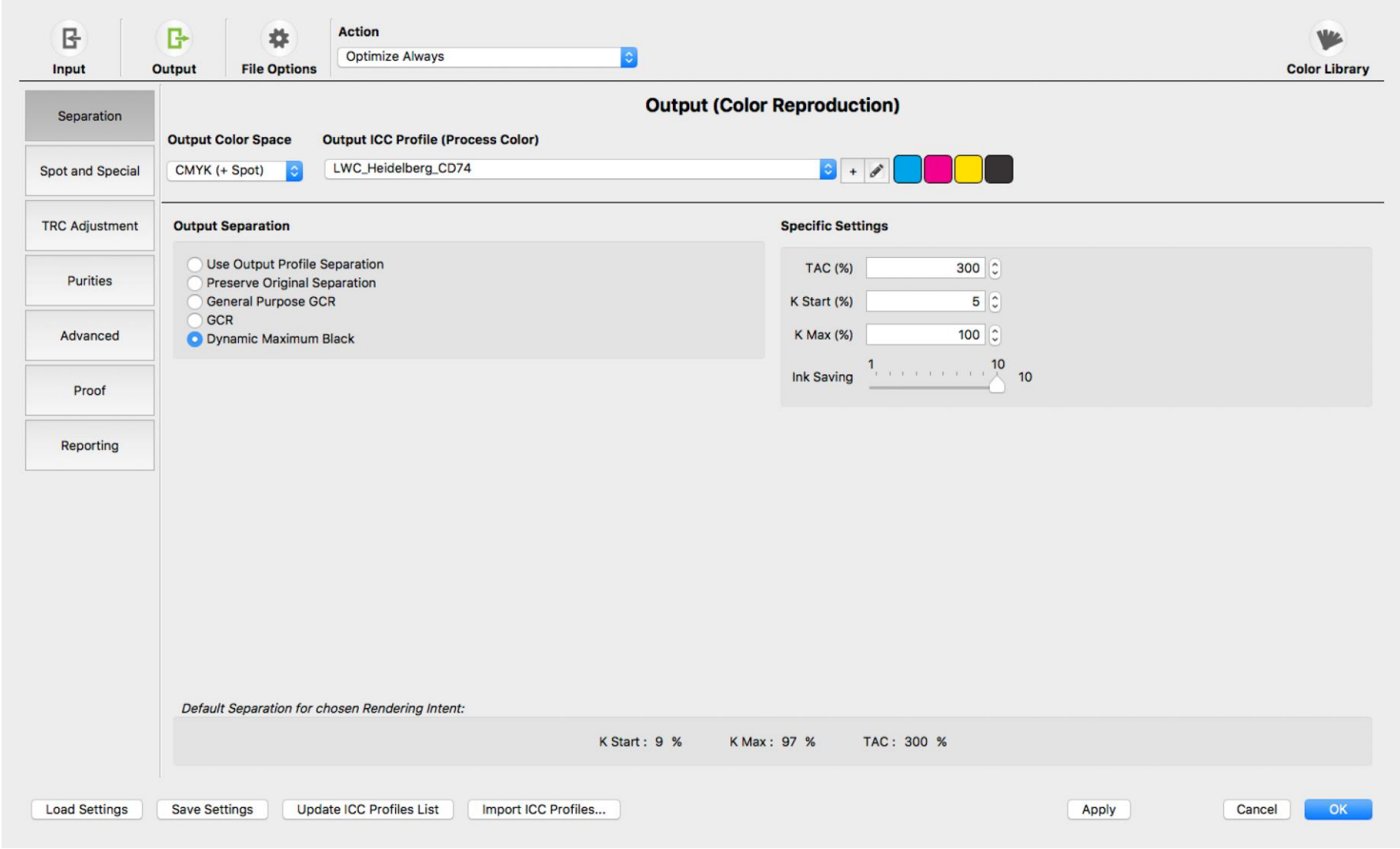
Hydra Profiling® with ACH
Import dataset



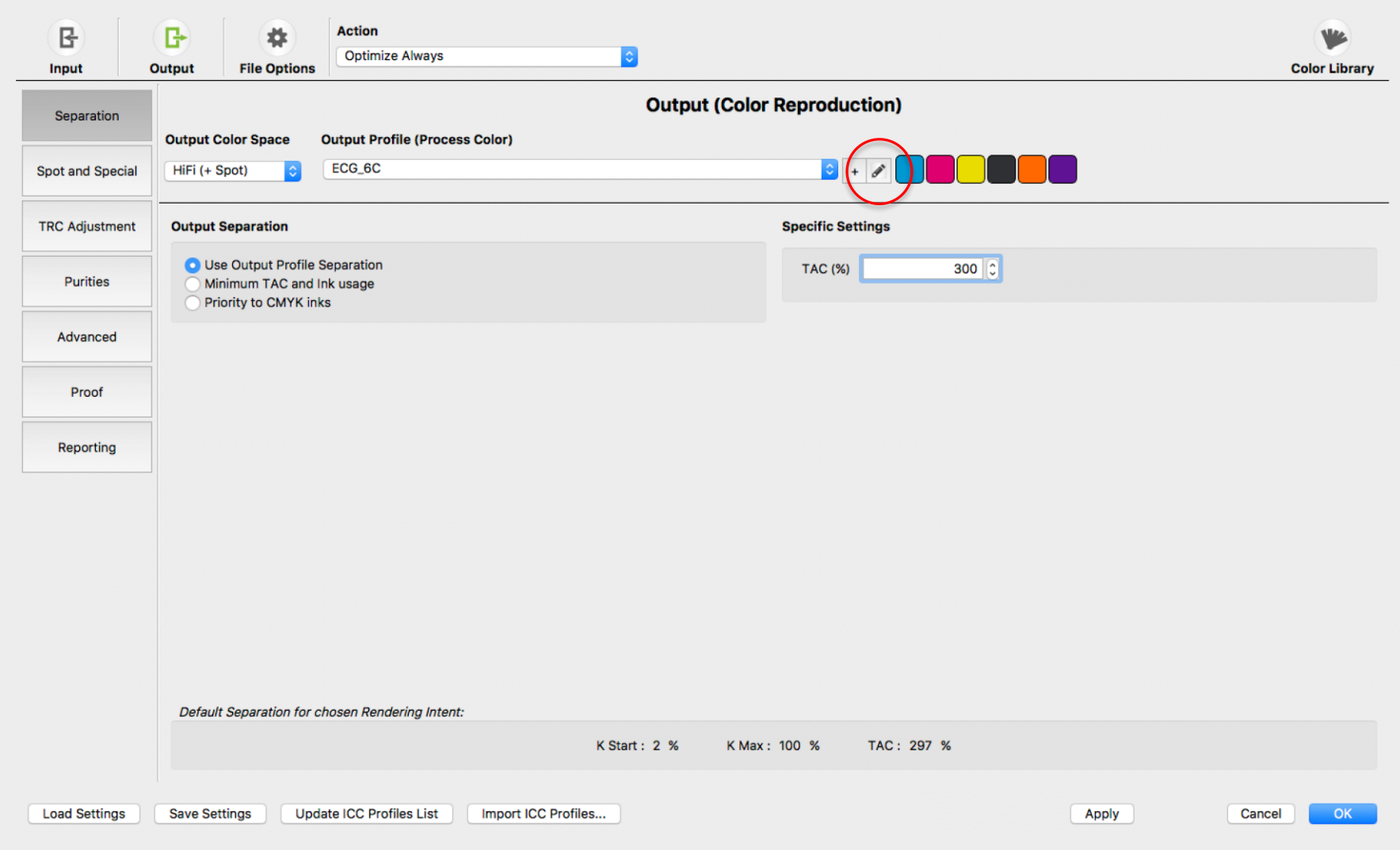
Hydra Profiling® with ACH
Choose ink channels



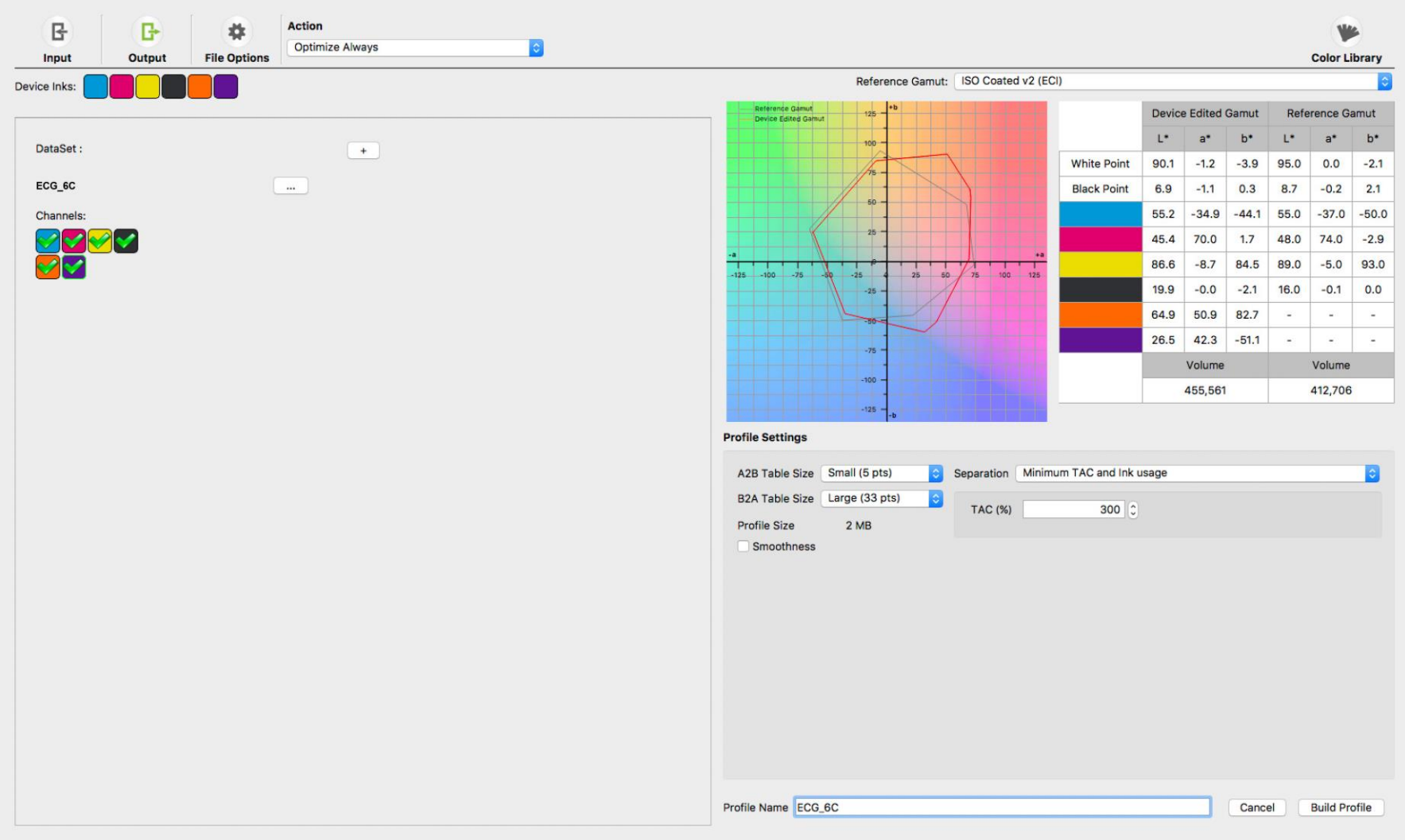
Hydra Profiling® with ACH
Build profile



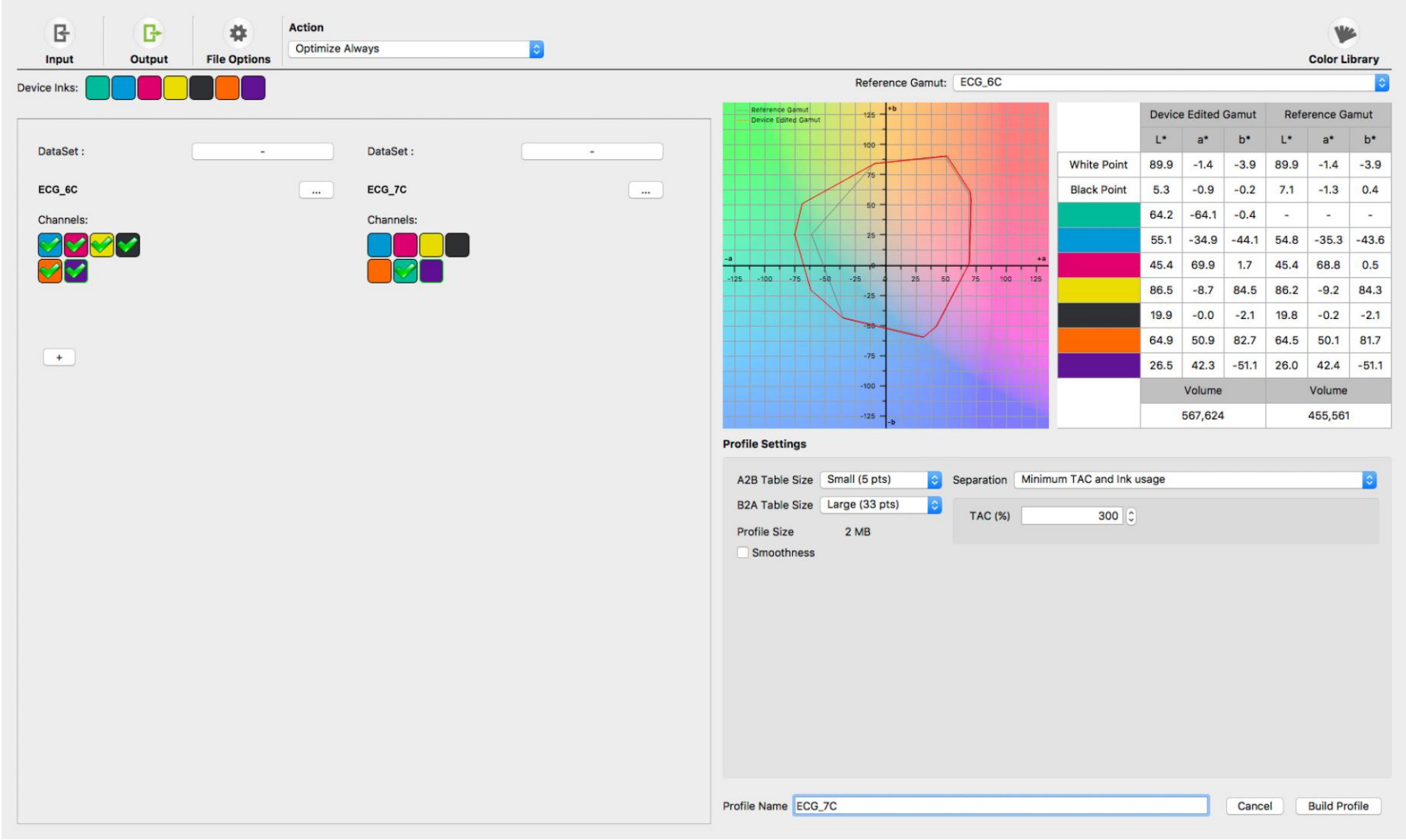
Hydra Profiling® with ACH
Editing a spectral profile



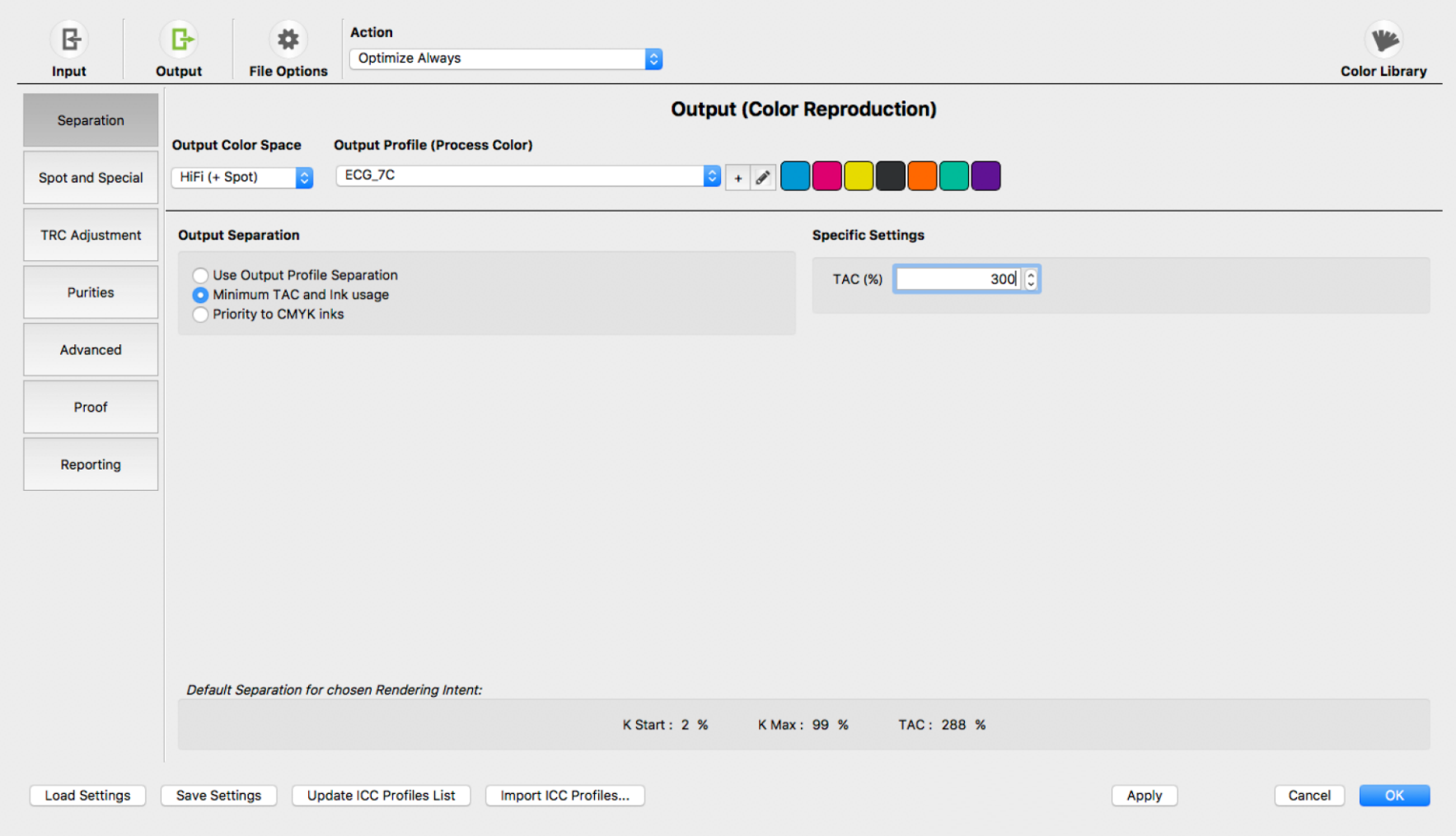
Hydra Profiling® with ACH
Editing a spectral profile



Hydra Profiling® with ACH
Add dataset and choose ink channels



Hydra Profiling® with ACH
Build profile



Hydra Profiling® performance

Hydra Profiling® performance

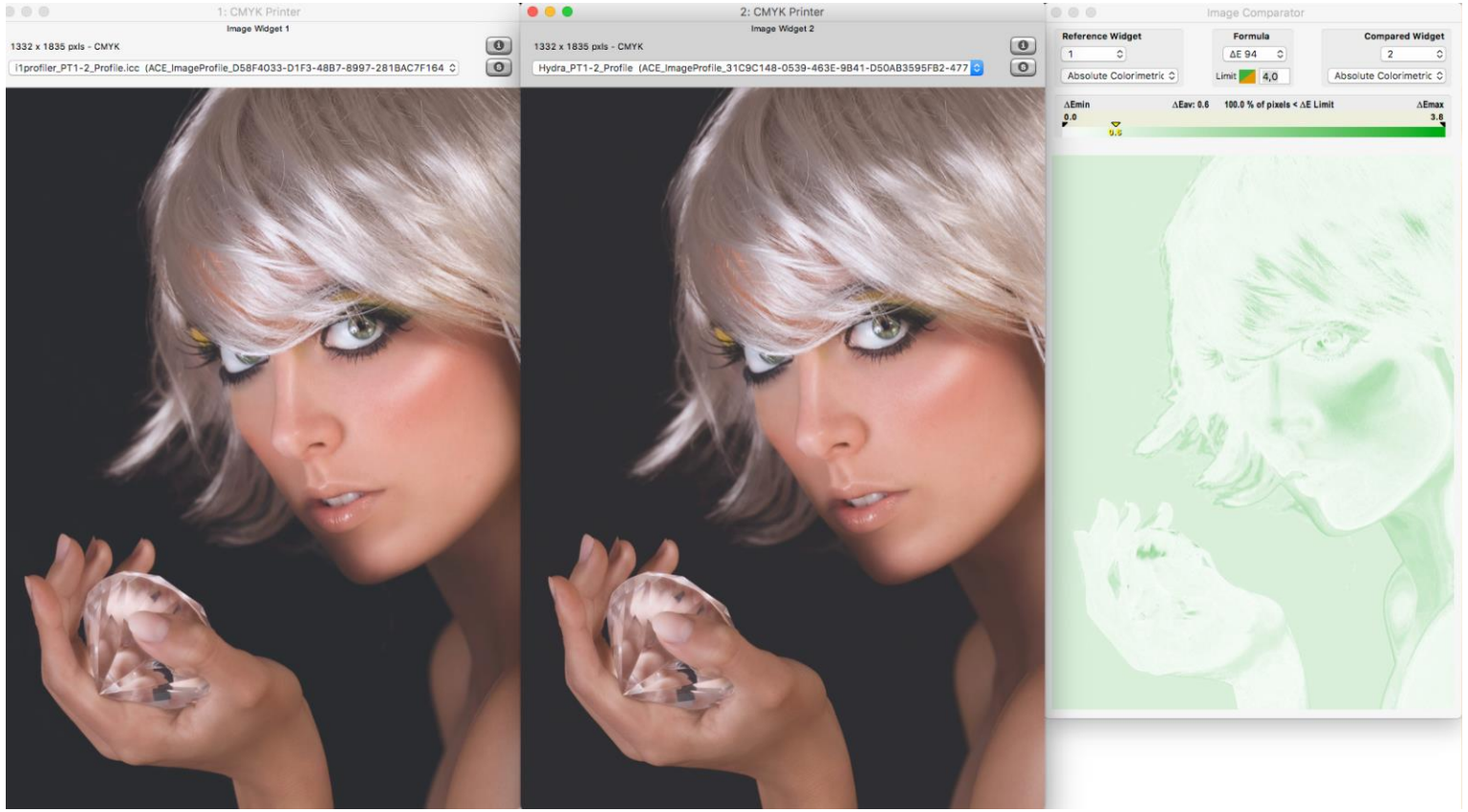
- **Spectral prediction accuracy (A2B)**

CMYK Profiles						
	IT8.7/4 Reference 1638 Patches	Offset - Coated Paper 40 Patches	Flexo - Coated Paper 40 Patches	Flexo - Flexible film 135 Patches	Inkjet - Coated Paper 220 Patches	Toner - Coated Paper 220 Patches
Average ΔE_{00}	**0.5 - 1.0**	0.8	1.0	0.9	0.9	0.9
Best 95% ΔE_{00}	**0.5 - 1.0**	0.8	0.9	0.9	0.7	0.8
Max 95% ΔE_{00}	**2.0 - 4.0**	1.8	2.4	2.8	3.9	2,2

- Alwan Hydra® profiles are as accurate as IT8-based profiles, with 10 to 40 times less patches, work and cost!
- Above ΔE00 show A2B tables accuracy on calibrated processes.

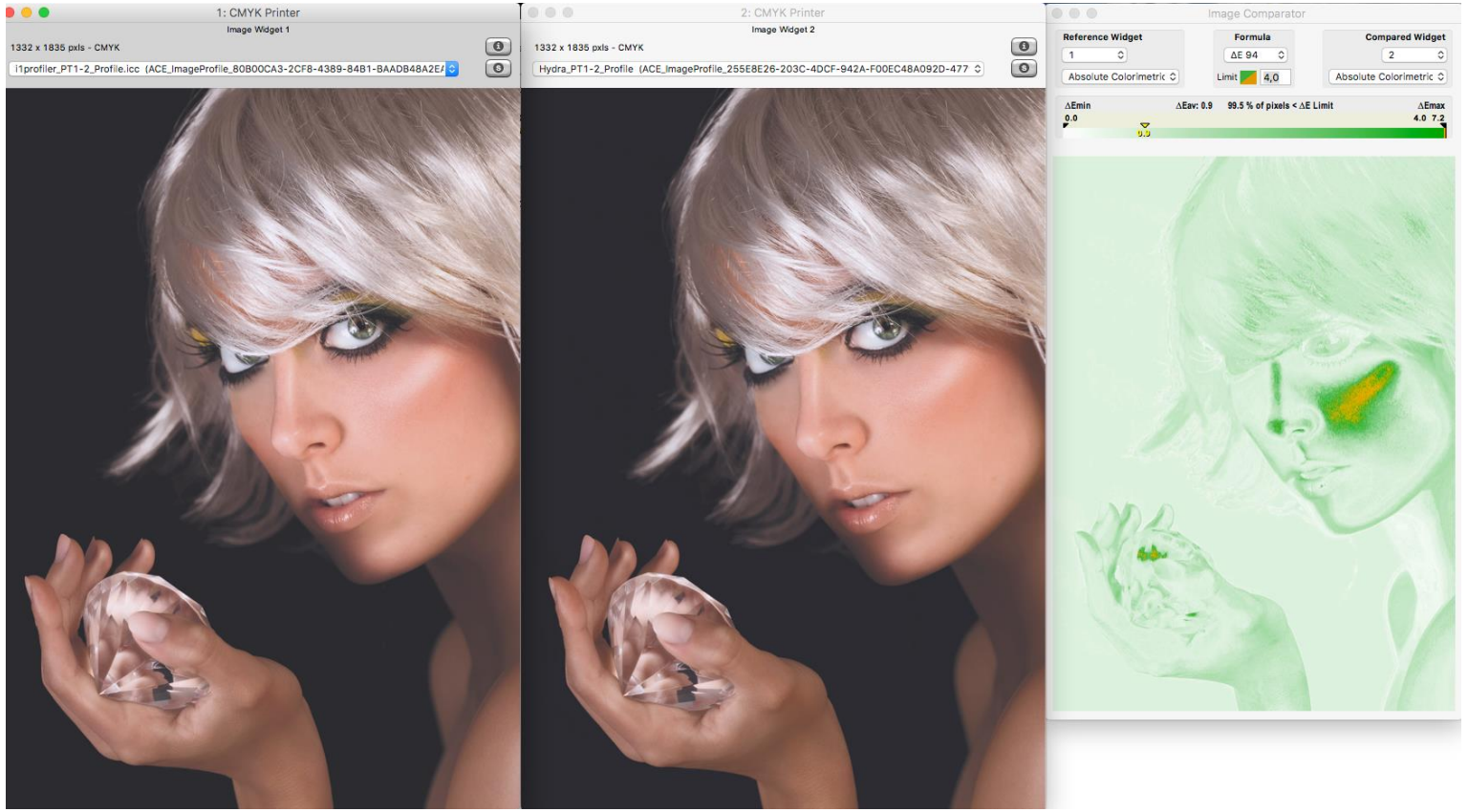
Hydra Profiling® performance

- **Relative colorimetric separation (B2A)**



Hydra Profiling® performance

- **Perceptual separation (B2A)**



Questions?

Alwan
Color Expertise

Thank you!

For more information: info@alwancolor.com