Print Control Wizard 20.0
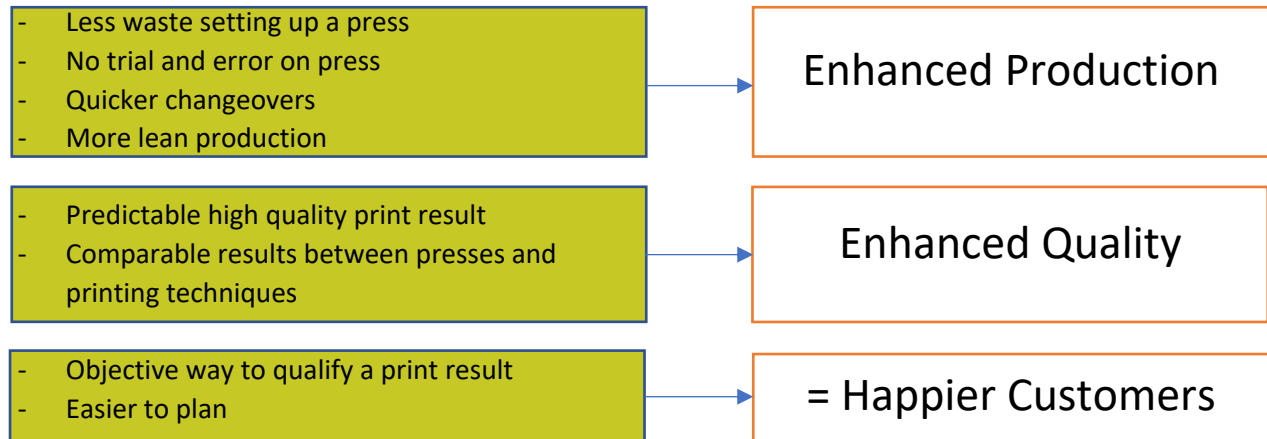
Standard Operating Procedure

What is a Printing Standard?

ESKO✪

1. About Printing Standards

In the process of becoming a mature sector, several printing standards were developed. The aim of such a standard is defining the quality parameters of a printed job. Setting up a printing environment that complies with a standard is a shared task between a prepress department, the plate department and the actual printroom.

The benefits of a standardized production:

- Less waste setting up a press - No trial and error on press - Quicker changeovers - More lean production	Enhanced Production
- Predictable high quality print result - Comparable results between presses and printing techniques	Enhanced Quality
- Objective way to qualify a print result - Easier to plan	= Happier Customers

A printing standard always defines the measurable, mathematic features a printed result. Simply put, depending printing technique and substrate you should be in tolerance with defined:

1. Full Tone LAB color value for Cyan, Magenta, Yellow and Black
2. TVI (dot gain) characteristic

The way of setting up a printing environment that produces according a standard always begins at press side. A typical way of reaching this goal is:

1. Define the press setup to produce highest quality and repeatable condition, in tolerance with Full Tone LAB values
2. Create a Screen and a Curve in prepress to make sure the repeatable press setup complies to the defined TVI values
3. Set up a workflow where Quality Control measures are active in prepress, toolmaking and press environment

2. Printing Standards in Color Pilot

Before choosing which standard to use, it's important to reflect on your current situation and decide about the path forward to reach that goal. The process of setting up a printing condition captures the most important parameters that will define the printed outcome. These parameters need to be subject to process control measures to guarantee a consistent result that matches a standard.

In Print Control Wizard / the Screening Section of Color Pilot the "Printing Standards" dialogue pops up a list. Basically you can see two groups:

- The Standards – the right prepress settings if press outcome matches an ISO standard
- The Specifications – G7 method
- Balanced Tone and Grey, Linear Density and Linear Color (Esko properiatery)

Depending choice you can immediately see the values defined in that particular standard listed under "Details" below the pop up list.
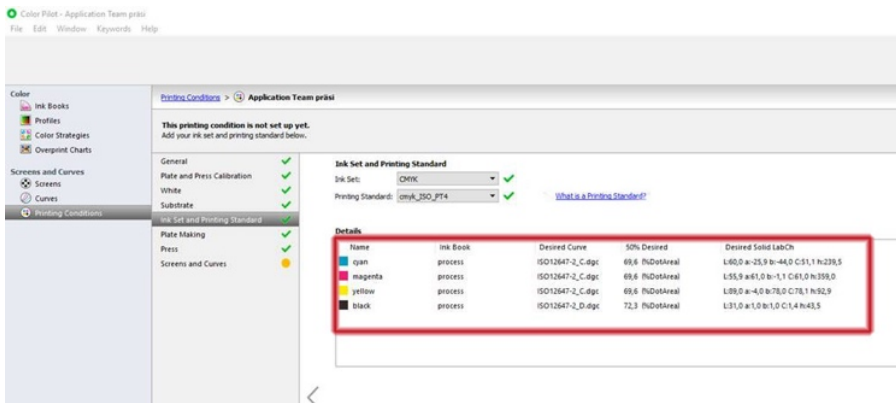
These values are now the desired values, the values you want to measure after you have printed according the standard of choice. The software will create a screen and a curve, based on measurements from a printed sample (printed according previously set up Printing Condition) to match the choosen Print Standard.

For each standard listed in the pop-up menu you can find a freely available .icc profile that can be used in prepress to simulate that specific printing condition on, for instance, a monitor or a proofing device. Profiles can be found on www.eci.org, but are also made available on your system by installing the Color Pilot software.

3. What parameters add up to a standard?

- **Color**: measured by a spectrophotometric device. Each process color (CMYK) printed at 100% has to match a specific Lab / Lch value.
- **TVI**: Tonal Value Increase – the correct term of what is often called dot gain. Measured directly by a densitometric device or calculated from a spectral measurement.
- **Substrate**: As color and TVI are influenced by the material used to print on, ISO has defined 5 classes of substrates. The difference is based on the white point of the substrate and the absorption level. A coated glossy material will have more saturated color values and lower TVI values compared to an uncoated material which absorbs and diffuses the ink more. This will lead to less bright colors at 100% and darker tone values due to increased TVI. To have the best possible visual match between printed jobs on these materials, ISO defined the different Lab and TVI values to reach this goal.
- **Knowledge**: there are different methods of measuring density, color and calculating TVI. To match a standard, or to communicate about color, you need to be aware that the current range of densitometers and spectral devices have the ability to setup different 'measurement conditions'. When 2 identical and well calibrated devices measure a same color, the result can be very different according which condition is chosen.

    In below table the available standards are listed, together with TVI value and use case:

Pop-up name	subclass	description	TVI on 50%	% Dot Area	ICC Profile
cmyk_ISO_pt1&2	Paper Type 1&2	Gloss and Matte Coated	14,3	64,3	ISOCoated_v2_300_eci.icc
cmyk_ISO_pt1&2(NP)	Paper Type 1&2 FM Screening	Gloss and Matte Coated	27,5	77,5	PSO_Coated_300_NPScreen_ISO12647_eci.icc
cmyk_ISO_pt3	Paper Type 3	Light Weight Coated	17	67	PSO_LWC_Standard_eci.icc
cmyk_ISO_pt4	Paper Type 4	Uncoated White Offset	19,5	69,5	PSO_Uncoated_ISO12647_eci.icc
cmyk_ISO_pt5	Paper Type 5	Uncoated Yellowish Offset	19,5	69,5	ISOuncoatedyellowish.icc
cmyk_ISO_web	Coldset Web Offset	Super Calendered Paper	17	67	Isowebcoated.icc
cmyk_ISO_newsprint	Heatset Web Offset	Standard Newsprint	19,5	69,5	PSO_SNP_Paper_eci.icc
cmyk_Fogra51	Print Substrate 1	Premium Coated	16,5	66,5	PSOcoated_v3_Fogra51.icc
cmyk_Fogra52	Print Subtrate 5	Wood-free uncoated white	23	73	PSOuncoated_v3_Fogra 52

4. Specifications

Besides global ISO standards, G7 Specifications are listed. These are not Standards and easier to implement as it often doesn't have the strict tolerance of an ISO Standard. The focus of G7 is on the gray balance rather then relying on TVI. The goal is to reduce the difference in appearance when judging printing on different presses and even printing techniques. Following specifications are available:

Pop-up name	Description
GRACol_G7	General Requirements for Applications in Commercial Offset Lithography
SNAP_G7	Specifications for Newsprint Advertising Production
SWOP_G7	Specifications for Web Offset Printing

Last but not least Esko has added 4 other special cases:

Pop-up name	Description
cmyk_LinearColor	TVI curves defied by spectral measurement - Delta E based
cmyk_LinearDensity	TVI curves defied by spectral measurement - Density based
BalancedToneAndGray	Aims for balance between graybalance and controlled TVI
cmyk_Equinox	Expanded gamut printing, predefined CMYK + Orange, Green, Violet

The cmyk_LinearColor and cmyk_LinearDensity aim both for improved hi-light printing characteristic in flexographic applications. As all the above listed Standards and Specifications originate in Offset it is hard to match the TVI behavior in the light printing areas when doing flexo. Flexo has a higher TVI compared to offset, which can be compensated by using stronger compensation curves. Due to the characteristics of a densitometric device, the measurements in very light tones are not very reliable. That's why the 2 settings measure the entire tone scale in a spectral way and calculates a curve. As result the light areas will appear closer to the Offset TVI. LinearColor will match the cmyk_ISO_pt1&2 TVI values on 50%, while LinearDensity will have a TVI of around 18%.