Proofing and printing documents that include spot inks

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Objectives

Designers can create a printable product that meets the brand requirements for colour.

Design can be proofed accurately on monitor or on hard copy proof.

Package (or other product) can be printed as the designer intended.
Ink model for packaging printing (process inks)

- Process set is Fogra39 (may not be usual for packaging printing)
- Spot set of inks
  - each ink characterised individually in some cases for each substrate on which it is printed (especially brand colours) - it is not usually practical to generate an ICC profile for all inks in combination

Printing sequence is specified (in the OutputIntent) as Orange, Silver and Spot_White
Spot ink characterisation

Minimum of 3, recommended 11 tint levels including solid and substrate

• Spot ink characterisation
  — spot colour measurement data provides the information necessary to estimate the ink opacity and hence the colour produced when this ink is printed on top of another colour
  — there is currently no standard way to communicate the spot colour measurement information from the document designer to the printer although there are a number of proprietary solutions
  — ISO TC130 is developing a standard way to communicate spot ink measurement data using CxF (ISO 17972-4 CxF/X-4)

Fewer patches may be printed on black than on substrate

Make measurements of spectral reflectance of each patch
About ISO 17972-4 (CxF/X-4)

- **Committee draft reviewed in Shenzhen - the following agreed:**
  - extend the set of measurement types supported
  - extend the set of substrate types
  - agreed to accept feedback from ICC Frankfurt meeting
- **Defines three conformance levels**
  - CxF/X-4 Complete Characterisation
    - allows the colour and opacity of the ink to be specified
    - particularly important in situations where an accurate proof of the spot ink printed on top of other content is to be made
  - CxF/X-4a Single Background Characterisation
    - for situations where the ink will only ever be printed on a single background and so can be characterised using a single set of spectral measurements (no printing on black is needed)
  - CxF/X-4b Single Patch Characterisation
    - for situations where it is useful to be able to communicate characterisation data for an ink where the ink will always be printed as a solid and so can be characterised using a single spectral measurement
Note that the ISO 32000-2 Draft specification disallows the inclusion of both Solidities and SpectralData for the same colorant and so no Solidities dictionary is included in the example.
Using ink opacity (solidity) for proofing

Object colour Lab alternate colour space

Foreground object (f)

Background (b)

Ink metadata: Solidity (S)

Output Intent ICC Profile

Ink opacity model

Proofer ICC Profile

Resulting colour (r)

Tint colour

X_f, Y_f, Z_f

A2B

X_b, Y_b, Z_b

B2A

X_r = f(S, X_f, X_b)
Y_r = f(S, Y_f, Y_b)
Z_r = f(S, Z_f, Z_b)

Baseline opacity model specified in ICC white paper
Using ink spectral reflectance for printing

Ink mixed according to manufacturer recipe if provided as part of the spot ink definition

Compare measurement data against reference
Meeting the objectives

Designers can create a printable product that meets the brand requirements.

Design can be proofed accurately on monitor or on hard copy proof.

Package (or other product) can be printed as the designer intended.

Brand manager selects colours based on print data.