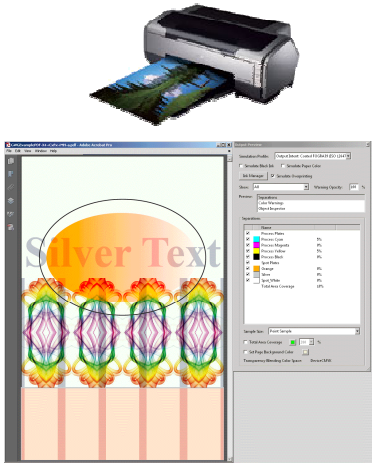
International Color Consortium

Proofing and printing documents that include spot inks

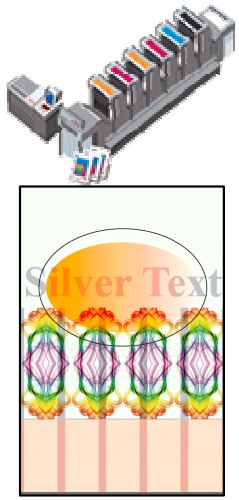
W Craig Revie, June 2013

Objectives

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

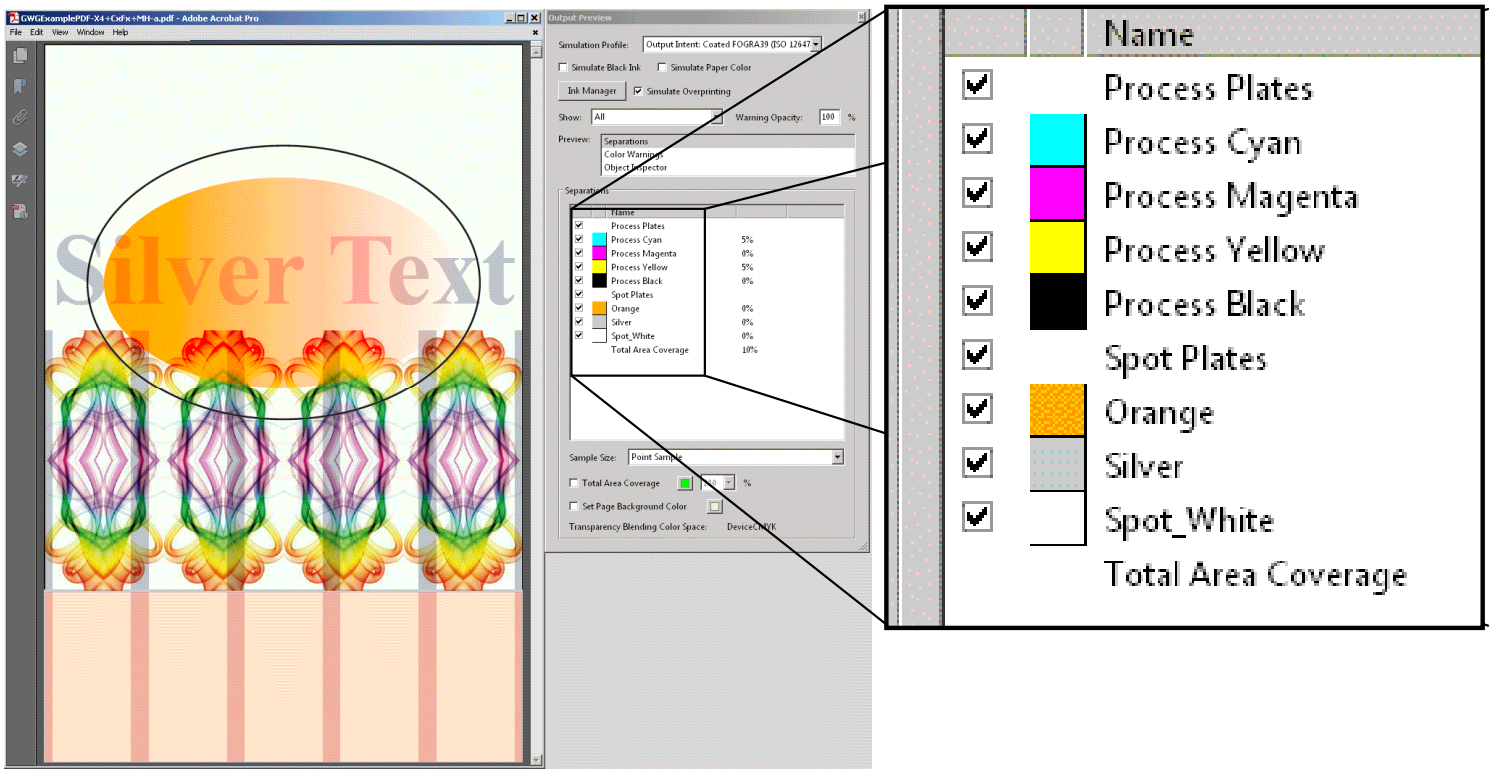


Design can be proofed accurately on monitor or on hard copy proof



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

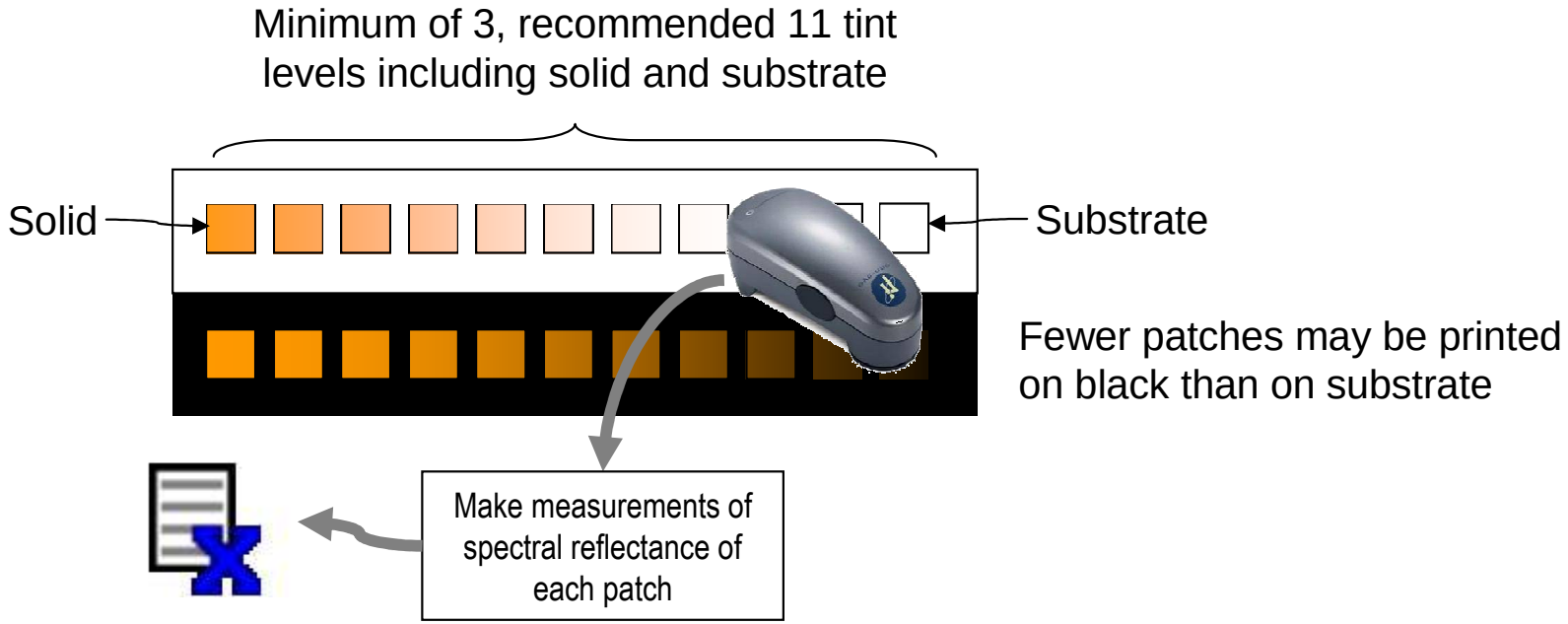
Ink model for packaging printing (process inks)



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

- **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

Spot ink characterisation

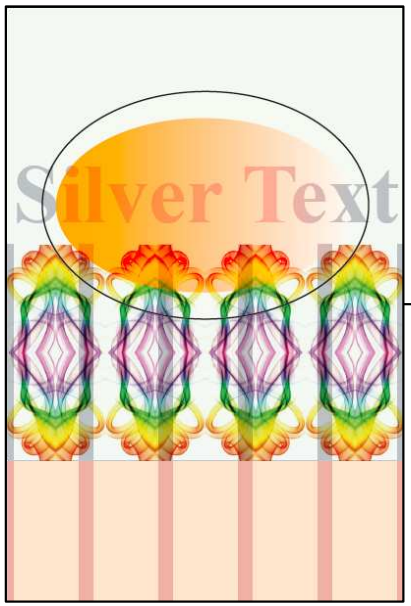


- **Spot ink characterisation**
  - spot colour measurement data provides the information necessary to estimate the ink opacity and hence the colour produced when this ink is printed on top of another colour
  - there is currently no standard way to communicate the spot colour measurement information 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)

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

ISO 32000-2 proposed PDF support



Output intent dictionary
- DestOutputProfile
- MixingHints
- SpectralData

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MixingHints dictionary
- Solidities
- PrintingOrder

Solidities dictionary
- Orange (0.6)
- Silver (0.3)
- White (0.3)

PrintingOrder dictionary
- Cyan
- Magenta
- Yellow
- Black
- Orange
- Silver
- Spot_White

SpectralData dictionary
- Orange
- Silver
- Spot_White

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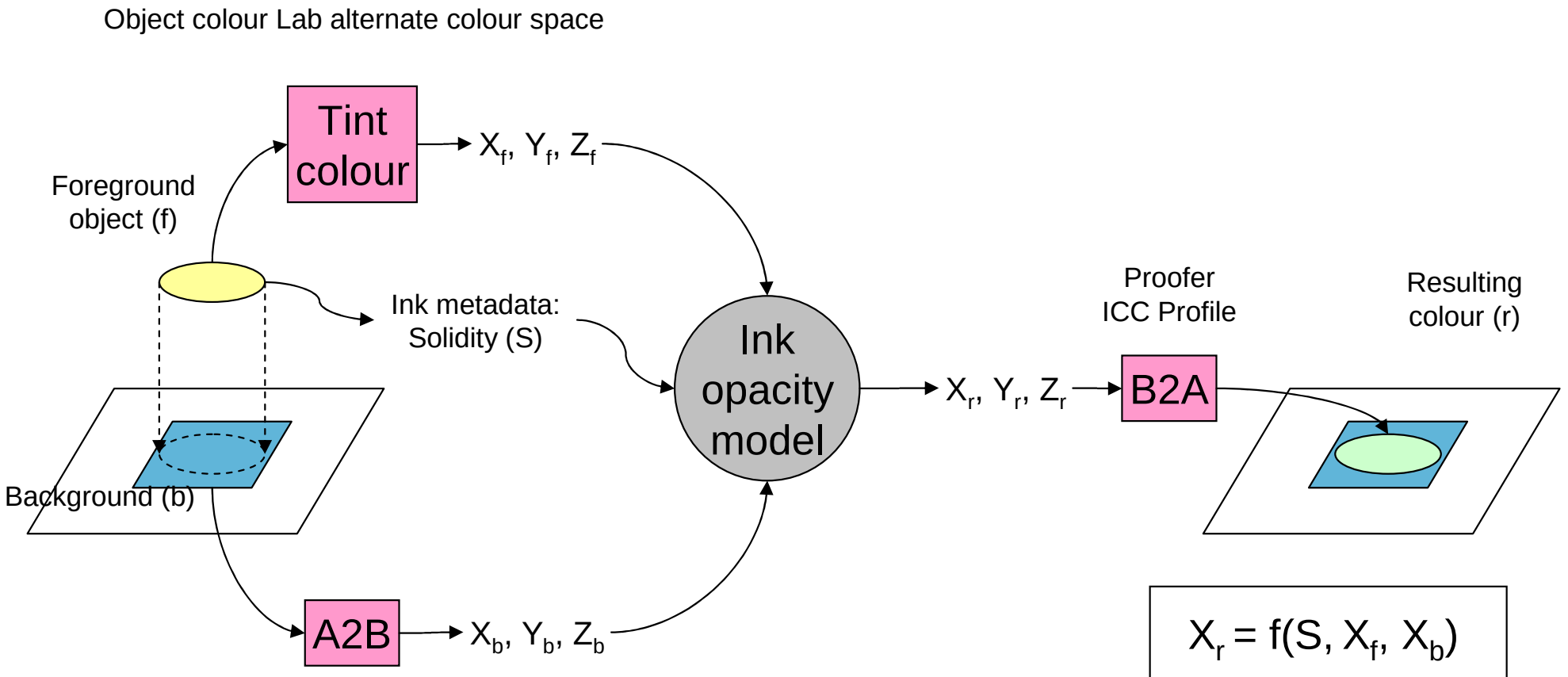
Note that the ISO 32000-2 Draft specification disallows the inclusion of both Solidities and SpectralData for the same colorant and so no Solidities dictionary is included in the example.

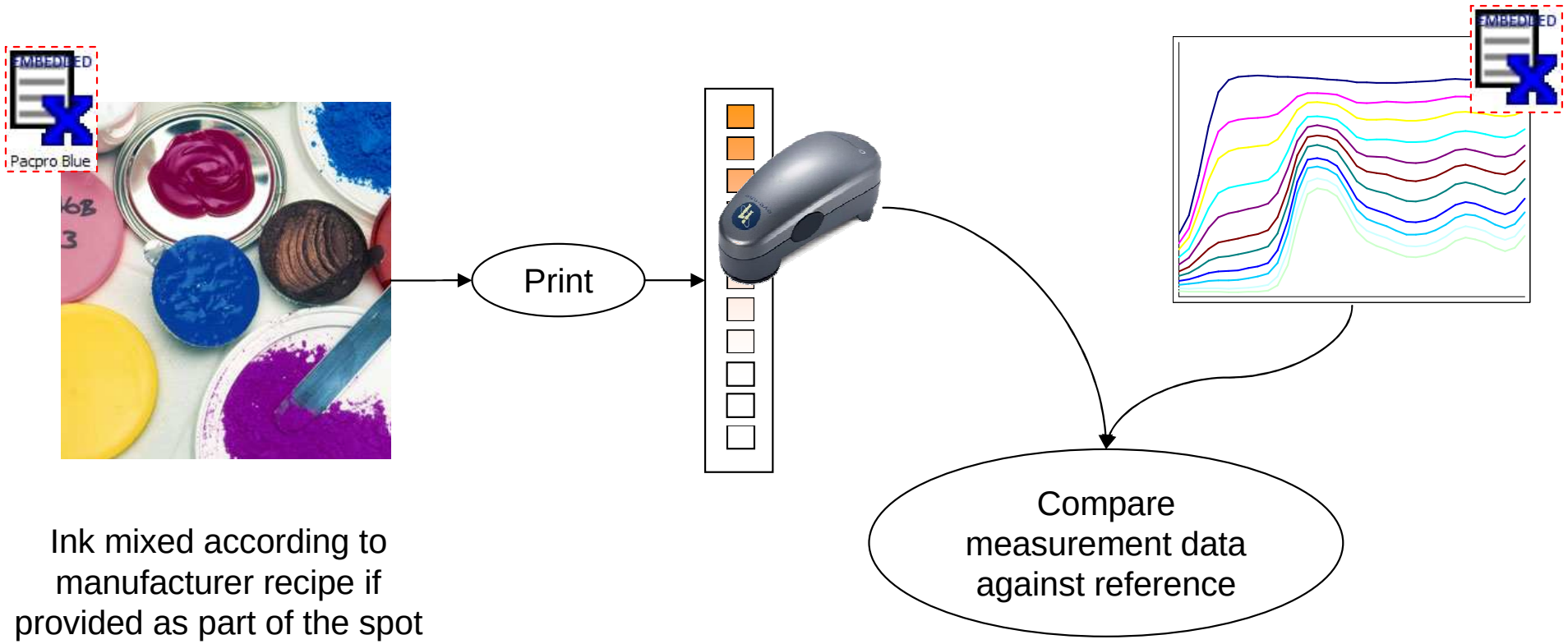
Using ink opacity (solidity) for proofing



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

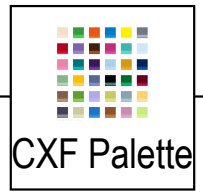
Baseline opacity model specified in ICC white paper

Using ink spectral reflectance for printing

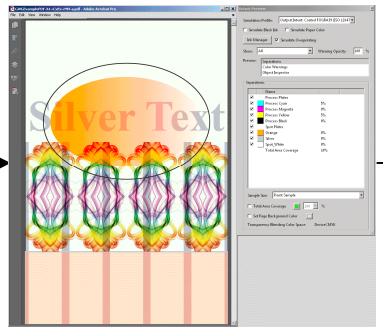


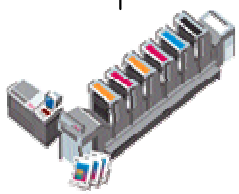
Ink mixed according to manufacturer recipe if provided as part of the spot ink definition

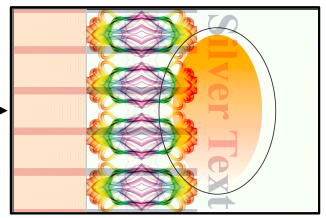
Meeting the objectives



Brand manager selects colours based on print data







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