# ICC Colour Management and Graphic Arts Colorimetry Issues

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Why Colour Management

- **Goal of Colour Management**
  - Reliable, predictable reproduction of colour
  - "Seamless" colour across devices and documents
- **Challenge: many variables and uncertainties in workflow**
  - Output is device- and media-dependent
  - Devices require characterization and calibration
  - Gamuts of devices and media are different

Image source

Image output

Colour exchange space
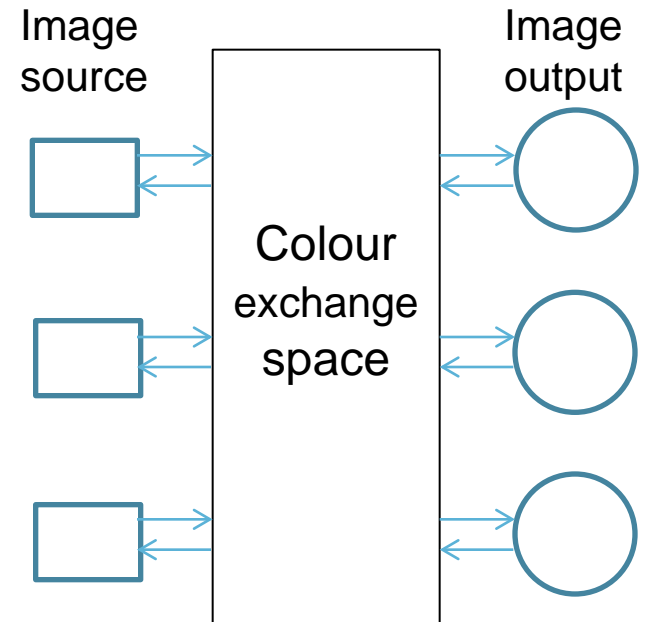
With colour management: via a colour exchange space, one transform is required per device, avoiding 'many-to-many' transforms

International Color Consortium

- **ICC is a consortium of member companies (approx 50 members)**
- **ICC maintains the profile format specification**
  - Co-published with ISO TC 130
  - ISO 15076-1 published 2005, revised 2010
- **ICC publishes White Papers, Technical notes and other information to aid developers and users through its web site**
- **ICC maintains a number of registries**
  - Tag signatures
  - Characterization data
  - Metadata
  - Standard profiles

Achieving 'seamless colour..'

Predictable reproduction of colour requires:

— Well-defined profile and PCS specification

— Standardized workflows, test targets

— Press characterization data representing standard printing conditions

— Reproduction aims and tolerances that conform to customer requirements

All specifications must be completely unambiguous

— Early implementations were often incorrect, leading to loss of confidence by customers

— All implementors must be able to achieve identical results for colorimetric intents (within precision limits)

ICC relationship with ISO TC 130 and other standards bodies

ICC has strong links to TC130

— ICC is a consortium of vendors - TC130 is more broadly based and includes many industry associations

— Many experts attend meetings of both organizations

— ICC proposes new work items to TC130 where ISO standardization is desirable

Other liaisons

— ISO TC42 (Photography)

— ISO TC6 (Paper)

— Ghent Work Group (workflow)

— SC28 (office equipment)

— CIE

— ….

Some current ICC work items in Graphic Arts

Spot ink proofing and printing

—How to carry information on ink reflectance and opacity in PDF

—How to predict solid and tint overprints

Metrology

—How to define colorimetry and appearance of non-paper materials

Exchange gamuts

—How to exchange data between output media with different colour gamuts– especially for large-gamut digital print

—How to render to and from the ISO 12640 reference gamut

Black point

—How to unambiguously scale media black points

Media white point

—How to compensate for differences in substrate colour

Why ICC supports this workshop

Standards are important

—Customers increasingly rely on standards for colour reproduction to deliver predictable colour

—Standards protect both producer and consumer

—Vendors rely on standards to ensure interoperability of hardware and software

Standards must be unambiguous

—Numerical definitions of colour that arise from applying a given transform within different software implementations must give the same results

—Computational robustness is essential

—Inversion must retain accuracy on multiple round trips

Thank You!

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