

# Working to International Printing Standards

---

Robert Chung, Professor  
Rochester Institute of Technology  
Rochester, NY, USA  
June 17, 2011  
Hong Kong, China



# Introduction

---

- This is an introduction to ISO TC130 printing standards.
- We will explore TC130 standards by answering the following questions:
  - What is standardization?
  - What is ISO TC130?
  - How are consensus-based standards developed?
  - Why is adopting global printing standards important to us?
  - What are the important developments in WG3 (Process Control)?
  - What are the important developments in WG13 (Certification)?
  - What is PSA (Print Standards Audit) Certification?

# Standardization and Its Benefits

- Standardization – Consensus-based activities to introduce order and address common needs
- Benefits of standardization
  - Align quality expectations (define parameters and metrics in terms of aims, tolerances)
  - Enable process control (doing the right thing, e.g., use color bar, bar, spectrophotometer, SPC tools)
  - Increase confidence and build trust (knowing that right thing being done, e.g., certification)
  - Enable producers to become more competitive and profitable

# ISO TC130 Graphic Technology

- **Mission**
  - Standardization of terminology, test methods, and specifications in the field of printing and graphic technology
- **Milestone events in the past 40 years**
  - 1971 — TC130 created, but soon became dormant
  - 1979 — CEPS introduced; lacked data exchange standards
  - 1982 — DDES work started
  - 1984 — US ANSI/IT8 and CGATS created
  - 1988 — Characterization targets (IT8.7/1, 2, 3) introduced
  - 1989 — Reactivated TC130 in Berlin, Germany
  - 2011 — 13 Working Groups, 25 Participating members, 17 Observer members, 68 standards

# ISO TC130 Graphic Technology

- **Working Groups (WGs)**

- WG1 Terminology
- WG2 Prepress data exchange
- WG3 Process control & metrology
- WG4 Media & materials
- WG5 Ergonomics and safety
- WG6 Certified reference materials
- WG7 Colour management
- WG8 (with ISO/TC 42) ISO 13655
- WG9 (with ISO/TC 42) ISO 12640-5
- WG10 Management of security printing
- WG11 Environmental impact of printed products
- WG12 Postpress
- WG13 Printing certification requirements



## Developing Consensus Based Standards

- A typical 6-stage process in developing an ISO standard
  1. New work item (NWI) proposal
  2. Working draft (WD)
  3. Committee draft (CD)
  4. Draft international standard (DIS)
  5. Final draft international standard (FDIS)
  6. International standard (IS)
- Standards are living documents and require maintenance.
  - Standards must be reviewed at least every 5 years.

# Why is adopting printing standards important?

- **Working to standards improves quality.**
  - Quality is defined by conformance to known aims within established tolerances.
  - Press calibration and control provides assurance of achieving these aims.
- **Working to standards improves cost.**
  - Standardized aims, workflows, and calibration process cut make-ready time.
  - Repeatable operating conditions cut wastes.
  - Solving problems in the press room does not generate profits. Preventing problems and sticking to best practices does.

## Why is adopting printing standards important?

- Print buyers demand certified printers as preferred suppliers.
- Certification builds trust & enables multinational supply chains.
- Case Study: The German printing industry is a winner in the age of globalization
  - ~80% of all medium/large offset printers in Germany are Certified
  - Germany (a high cost country) has been able to increase exports by exploiting standards to produce high quality at competitive costs



## WG3 (Process Control) Update

- Revision of ISO 12647-2: 2004
  - Key concepts
    - Repeatable color comes from adhering to paper, screening, and printing aims, i.e., solids, TVI and midtone spread of CMYK
    - Reference printing conditions (including data sets) are the results of adhering to printing aims.
  - Key issues
    - Adoption of CIEDE2000
    - Assessment of grey reproduction of near-neutral triplets
    - Assessment of solid conformance on paper containing OBA through the use of substrate-corrected colorimetric aims

## WG3 (Process Control) Update

- **New standard ISO 15339-1**
  - Key concepts
    - Color is defined by a reference printing condition (including data set) and can be used as color data exchange space.
    - 7 Universal data sets (process agnostic) are based on a near-neutral model.
    - Printing is to print to data set conformance via various press calibration methods per ISO/TS 10128.
    - Repeatable color is the responsibility of the printer.
  - Key issues
    - Setting tolerances that are application & printing process dependent
    - Harmonizing with ISO 12647-2 aims to enable flexibility and efficiency in the design-proof-print workflow



# ISO Standards in Harmony

Decision	Design - Digital Data - Proof - Print Workflow		
	Design	Prepress	Printing
Reference printing condition (RPC)	Chosen based on preference or budget	RPC is communicated via the Output Intent tag of PDF	Printer knows how to calibrate the press per ISO 10128 via TVI, neutral, device link
Printing process, paper, quantity	Printing process, paper and quantity have not been selected	Paper may be selected. If so, proof shall simulate substrate white	Paper, printing process, and quantity are specified
Proofing / Printing	Use standard ICC profile; follow ISO 12647-8 Validation print; color is non-binding	Use standard ICC profile and follow ISO 12647-7 Contract proofing; color is binding	Printer print to ISO 12647-2 or ISO 15339 conformance. Good visual agreement between certified proofs and print.

## WG13 (Printing certification) Update

- **Key concepts**

- As printers move into the globalization of printing, it is important that the certification of printers and printing quality is consistent among certification bodies worldwide.
- WD 16761 specifies three sets of certification requirement:
  1. Conformance assessment to printing standards
  2. Printing quality management systems based on the guidelines of ISO 9001
  3. Accreditation of certifying bodies
- Key issues
  - Boundary between WG3 and WG13
  - Metrology, traceability, calibration, and uncertainty
  - Demonstrating sustained conformance to standards

# Printing Certification Activities

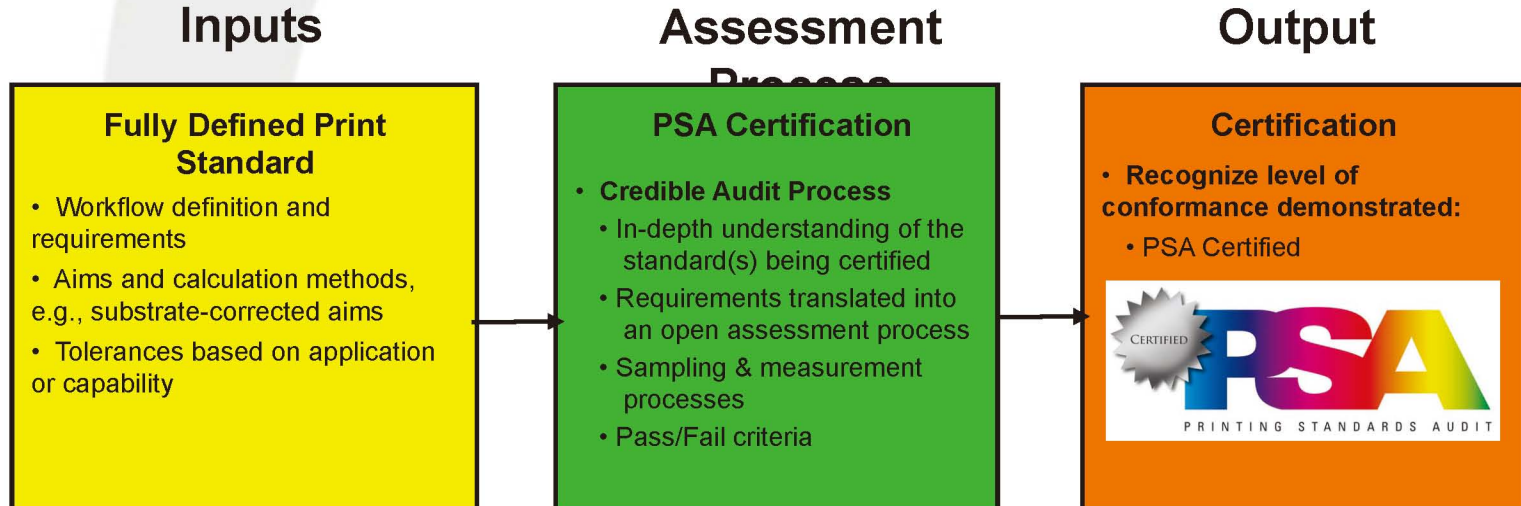
- How demand for certification is being met
  - Current approaches have strengths and weaknesses

Certification/ Qualification	Pros	Cons
PSO (500+ Printers)	<ul style="list-style-type: none"><li>• Based on ISO 12647-2 with complete aims &amp; tolerances</li></ul>	<ul style="list-style-type: none"><li>• Fixed paper types limit applicability on optically brightened papers</li><li>• Limited to one printing process</li></ul>
G7 (~600 Printers)	<ul style="list-style-type: none"><li>• Near neutral calibration works with any substrate and a variety of printing processes</li></ul>	<ul style="list-style-type: none"><li>• Proprietary standard (some aims are private)</li><li>• Lack impartiality and neutrality</li></ul>



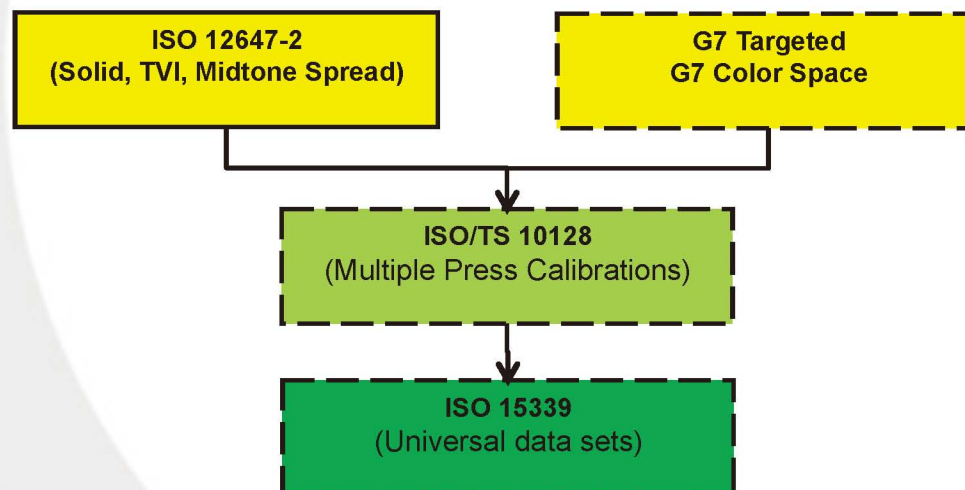
# PSA (Print Standards Audit) Certification

- Certification of conformance to graphic arts standards is best understood as a workflow with inputs, process, and outputs.



## PSA (Print Standards Audit) Certification

- RIT is advancing the state-of-art of printing standards and certification by
  - Harmonizing printing certification requirements via WG13
  - Extending print standards certification to include an assessment of the printer's quality management system
  - Developing guidelines to support standards evolution



## Summary

---

- ISO TC130 printing standards help align quality expectations between print buyers and printers and reduce inefficiency in the supply chain.
- The more geographically distributed a company is, the more compelling the benefits of international printing standards becomes.
- The more far-flung the print procurement operation is, the more importance of printing certification will be.
- PSA certifies printers according to ISO 12647-2, takes G7 to the next level by embedding it in a quality system, and embraces new standards like ISO 15339.



## Thank You for Your Attention

Robert Chung, Professor  
Rochester Institute of Technology  
Rochester, NY, USA

