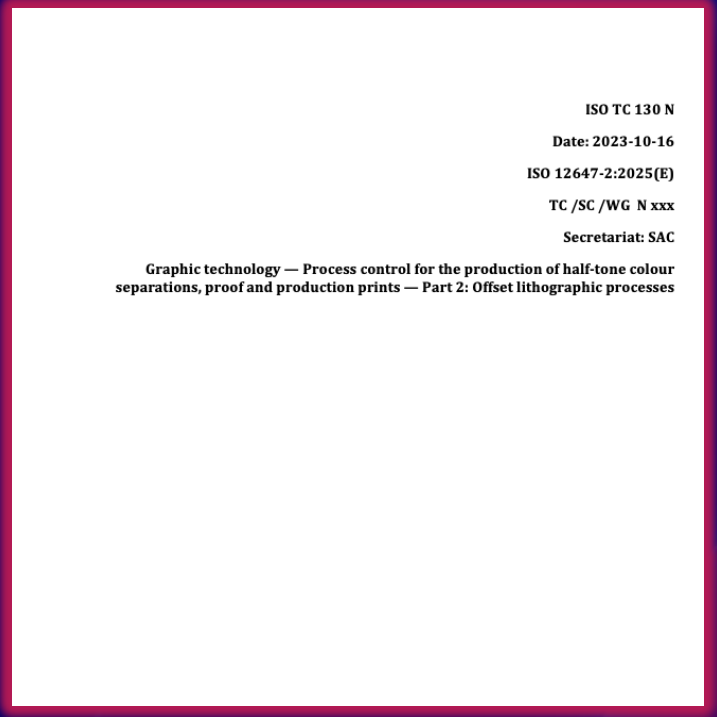
TAGA NextGen



ISO TC 130 N

Date: 2023-10-16

ISO 12647-2:2025(E)

TC /SC /WG N xxx

Secretariat: SAC

Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes

ISO Standards and their Importance in the Print Communications Industry, Today and Moving Forward!

Don Schroeder, Senior Director, Solutions Development
Fujifilm Business Innovation Division

Agenda

- Who is Don Schroeder, and why is he talking about ISO Standards?
- Overview of **ISO TC/130** for the Print Communications Industry
  - What is ISO TC/130?
  - Working Groups
- Why Standards are effective today in the Print Communication Industry
- Important Updates on Working Group 3, **ISO 12647-2**

TAGA NextGen

2026

How did I get involved?

I work for a Global Company who takes Standardization very seriously

- We have many divisions that require strict adherence to not only a standard of “Quality” delivered but a Standardization commitment to the world-wide marketplace.
- I started at Fujifilm in 1991 and immediately got acquainted with Standards!
- This was back in the time of Standardizing SWOP, GRACoL and the very early beginnings of PDF specifications.
  - These Specifications turned into Standards in one way or another!
- Today we use CRPC’s (**Characterized Reference Print Conditions**) that are now contained in ISO 15339-2!
- Started attending USA CGATS meetings in mid 1990s
- Started attending TC/130 USA meetings in early 2000s
- Started attending International TC/130 meetings in 2016
- Today I am the head of the USA Delegation!

CRPC	Substrate colour			Printed solid colours											
				Cyan			Magenta			Yellow			Black		
	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*
1	85	1	5	59	-24	-26	56	48	0	80	-2	60	37	1	4
2	87	0	3	57	-28	-34	52	58	-2	82	-2	72	30	1	2
3	96	1	-4	60	-26	-44	56	61	-2	89	-3	76	32	1	1
3.5	96	1.5	-8	58	-25	-50	52	66	-1	91	-4	86	28	1	-2
4	89	0	3	55	-36	-38	47	66	-3	83	-3	83	23	1	2
5	92	0	0	57	-37	-44	48	71	-4	87	-4	88	19	0	1
6	95	1	-4	56	-37	-50	48	75	-4	89	-4	93	16	0	0
UCD	95	1	-6	56	-35	-53	48	75	-5	89	-4	92	16	0	0
PAK	93	0	0	55	-37	-46	47	73	-2	87	-5	92	16	0	0
7	97	1	-4	54	-42	-54	47	79	-10	90	-4	103	14	0	0

What is an ISO Standard?

Who here can tell me what an ISO standard is?

- ISO Standards are **internationally recognized guidelines and specifications** developed by the International Organization for Standardization (ISO). They ensure quality, safety, efficiency, and interoperability across industries and global markets.
- ISO Standards are **globally agreed-upon frameworks** that define best practices, technical requirements, and quality benchmarks for products, services, and systems.
- Standards are **created through international consensus** involving experts, industry leaders, and government bodies. Businesses adopt ISO Standards to improve operational performance, meet regulatory requirements, and strengthen customer trust.

- Some well-known ISO Standards include:
- **ISO 9001:** Quality Management Systems
- **ISO 14001:** Environmental Management Systems
- **ISO 27001:** Information Security Management

What is an ISO Standard?

Frequently Asked Questions (FAQs)

- **Are ISO Standards mandatory?**

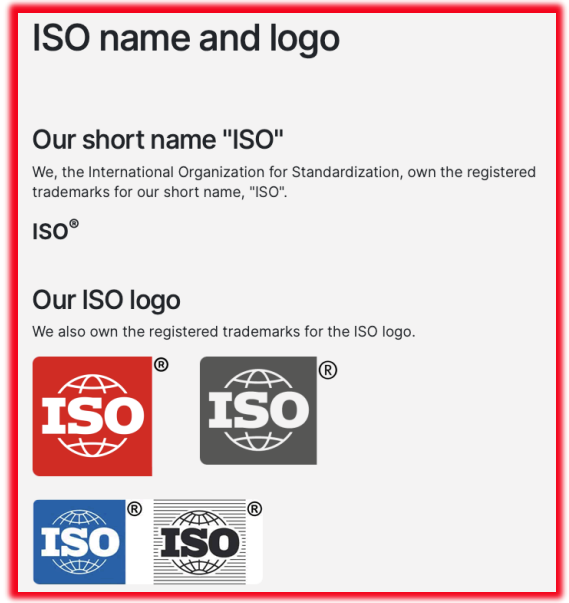
Not usually, but they may be required by regulators or business partners.

- **How are ISO Standards developed?**

Through International collaboration between experts and member bodies.

- **Do ISO certifications expire?**

Yes. They require periodic audits and recertification.



What is TC/130?

ISO/TC 130, or ISO Technical Committee 130, "Graphic Technology," defines international standards for all aspects of the printing and graphic arts industry, covering everything from initial image creation, data exchange (like PDF/X), process control, color management (with ICC), quality assessment, and environmental impact, ensuring interoperability, efficiency, and quality in digital and physical graphic workflows.

What is a Working Group

An ISO Working Group (WG) is a **small team of international subject-matter experts**, formed under an ISO Technical Committee (TC) or Subcommittee (SC) (like ISO/TC 67/WG4 for oil & gas), tasked with drafting new or revising existing international standards.

- These experts, representing industry, government, academia, etc., discuss technical details, terminology, and consensus, creating working drafts (WDs) until a satisfactory solution is reached, after which it moves to wider committee review and ballot.
- **Participation:** To join a WG, you typically need to be part of your country's national mirror committee (like a U.S. Technical Advisory Group, or TAG) and request participation through its administrator.

What are the TC/130 Working Groups?

WG number	Title	Personnel
WG 1	Terminology Scope: Working Group 1 is concerned with terminology in the field of printing and graphic technologies. This includes not only an overview and reconciliation of the terms and definitions used in TC 130, but also the development and review of standards concerned with proofreading of text and other related topics.	Convenor: Dr. David Penfold, UK Secretary: Lucy Liu, CN
WG 2	Prepress data exchange Scope: To develop standards for the exchange of digital data used in the graphic arts and print production.	Convenor: Mr. Steve Smiley, US Secretary: Ms. Julie Shaffer, US
WG 3	Process control and related metrology Scope: Development and review of ISO Standards and other related documents in the area of process control and related metrology for the production of printed matter used in the responsibility of ISO TC 130.	Convenor: Dr. Andreas Kraushaar, DE Secretary: Mr. Boris Reznicek, DE
WG 4	Media and materials Scope: Development and review of ISO Standards and other document in the area of media and materials used within the overall scope of ISO TC 130.	Convenor: Mr. Tadanobu Sato, JP Secretary: Ms Ayumi Katsuki, JP Secretary Support Team: Mr Toshihisa Yamanaka, JP

WG 5	Ergonomics - Safety Scope: TC 130/WG 5 (Ergonomics – Safety) develops international safety standards for: Prepress and press equipment and systems, binding and finishing equipment and systems, converting equipment and systems, stand-alone platen presses These standards addresses recognized significant hazards specific to equipment and systems in the following areas: mechanical; electrical; slipping, tripping, falling; ergonomics; noise; UV and laser radiation; fire and explosion; thermal; substances and material used for processing; failure, malfunction of control system other types of emissions [e.g. ozone, ink mist, volatile organic]	Convenor: Mr. Roger Starke, DE Secretary: Ms. Julie Shaffer, US
JWG 7	Colour management (Joint TC 130 - ICC WG) Scope: JWG7 under the leadership of TC 130 is to work with the ICC around the standardization of colour management and its implementation, and to invite ISO/TC 42 and others to join in this JWG.	Convenor: Mr.Max Derhak, US Secretary: Ms. Julie Shaffer, US
WG 10	Security printing Scope: Management of security printing processes.	Convenor: Mr. Marc Been, NL Secretary: Mr. Ab de Buck, NL

What are the TC/130 Working Groups?

WG 11	Sustainability of Graphic Technology Scope: Standards related to the sustainability of graphic technology within the overall scope of ISO/TC 130.	 	Convenor: Ms. Laurel Brunner, UK Ms. Julie Shaffer, US
TC 130/WG 12	Postpress Scope: ISO/TC 130 Working Group 12 is engaged in developing and reviewing standards and other documents related in the field of postpress.	 	Convenor: Ms. Xiaohui He, CN Secretary: Ms. Meifang Li, CN
WG 13	Printing conformity assessment requirements	 	Convenor: Mr. Bruno Mortara, BR Secretary: Ms. Meifang Li, CN
JWG 14	Print quality measurement methods (Joint TC 130 - TC 42 - ISO/IEC JTC 1/SC 28 WG) Scope: JWG 14 develops print image quality metrics and their related measurement methods. These metrics are not limited to the assessment of prints produced using any specific printing technology.	 	Convenor: Mr. Frans Gaykema, NL Co-Convenor: Mr. Akihiro Ito, JP

TF 3	Communications Scope: To be "the voice of TC 130" to stakeholders in the printing and graphic technology industries by maintaining the TC 130 website with articles and news. To create new and update existing Guidance documents on how to apply relevant ISO standards in print and publishing production. To support the secretariat for TC 130 in future updates of the Scope and Strategic Business Plan.	 	Convener: Mr. Paul Lindström, SE Secretary: Mr. Gang Zhao, CN

Key ISO/TC 130 Working Groups & Their Focus

- **WG 1 (Terminology):** Defines terms for the graphic arts industry.
- **WG 2 (Prepress Data Exchange):** Develops standards for digital data exchange (e.g., PDF/X).
- **WG 3 (Process Control & Metrology):** Standards for printing process control and measurement.
- **WG 4 (Media & Materials):** Standards for inks, substrates, and other print materials.
- **WG 5 (Ergonomics & Safety):** Standards related to workplace safety in graphic technology.
- **WG 10 (Management of Security Printing):** Focuses on security features in print.
- **WG 11 (Environmental Impact):** Addresses sustainability in graphic technology.
- **WG 12 (Postpress):** Standards for finishing and converting printed products.

Key Joint Working Groups (JWGs)

- **JWG 7 (Color Management):** Works with the International Color Consortium (ICC) on color management standards (like iccMAX).
- **JWG 14 (Print Quality Measurement):** Joint effort with ISO/TC 42 (Photography) for print quality.

Technical and Business Impact of Standards

Technical and Business standards impacts of use **enhances efficiency, quality, and trust** by providing best practices, reducing costs through streamlined processes, minimizing errors, and enabling interoperability, which boosts innovation, facilitates global trade, and gives companies a competitive edge in winning contracts by proving commitment to benchmarks like ISO or cybersecurity protocols.

Technical Impacts

- **Interoperability & Compatibility:** Standards ensure different systems and components work together seamlessly, crucial for IT and technology.
- **Foundation for Innovation:** They provide a common baseline, allowing innovators to build upon established tech rather than reinventing the wheel, fostering collaboration.
- **Improved Performance:** Setting benchmarks helps engineers and developers meet higher quality, safety, and reliability targets.
- **Knowledge Sharing:** Common terminology and frameworks allow for better exchange of technical knowledge and best practices.

Technical and Business Impact of Standards

Technical and Business standards impacts of use **enhances efficiency, quality, and trust** by providing best practices, reducing costs through streamlined processes, minimizing errors, and enabling interoperability, which boosts innovation, facilitates global trade, and gives companies a competitive edge in winning contracts by proving commitment to benchmarks like ISO or cybersecurity protocols.

Business Impacts

- **Cost Reduction:** Minimizing errors, waste, & redundancies in processes leads to significant savings.
- **Increased Productivity & Efficiency:** Streamlined, standardized operations optimize resource allocation and speed up delivery.
- **Enhanced Quality & Trust:** Consistent processes ensure reliable products/services, building customer confidence and brand reputation.
- **Market Access & Competitiveness:** Meeting specific standards (like ISO 9001 for quality) opens doors to new markets and government contracts, helping SMEs compete.
- **Risk Mitigation:** Standards help identify and manage risks within operations and supply chains, from cybersecurity to environmental impact.
- **Facilitation of Global Trade:** Common standards reduce trade barriers, making it easier for products to be accepted internationally.

Stages of an ISO Project / Ballot

Key Stages of Development & Balloting

1. **Proposal Stage:** A New Work Item Proposal (NWIP) is submitted, and P-members (participating) vote on whether to start work, requiring a simple majority.

2. **Preparatory Stage:** Working groups develop drafts, with internal ballots (Working Drafts) potentially occurring

3. **Committee Stage:** Drafts (Committee Draft - CD) are circulated for national comments and voting by all member bodies.

4. **Enquiry Stage:** A Draft International Standard (DIS) is released for formal comment and voting; this is a key stage for feedback

5. **Approval Stage:** A Final Draft International Standard (FDIS) is voted on; if passed, it moves to publication.

6. **Publication Stage:** The final standard is published.

Ballot types

The balloting platform is used for the following ballot types:

Ballot type	Description	NSB participation
Committee Internal Ballots (CIB)	New Work Item Proposal (NP), Committee Draft (CD)*, Draft Technical Specifications (DTS)*, Draft Technical Report (DTR)*, Draft Publicly available Specification (DPAS)* and ad-hoc.	Vote is restricted to the member of the committee as follow: P-members must vote O-members can comment
Working Group Consultations	This is a consultation used by WG to gather opinion of WG members during drafting stage	Experts of the WG submit their comment
WD Study	The 'Working Draft (WD) study' is already common practice during the 'Preparatory stage' of a project and aims to gather comments from WG members on the draft (stage 20.20 and 20.60 in the International harmonized stage codes).	Experts of the WG submit their comment
DIS, FDIS, SR and WDRL	Draft International Standard (DIS); Final Draft International Standard (FDIS); Systematic Review (SR); Withdrawal Consultations (WDRL)	Vote is open to all members P-member of the committee must vote All ISO Members can vote
TMB/NP and TMB/TSP	Ballot used to vote to create a new committee on a new subject	Vote open to all members

For detailed information on project stages for standards development please refer to this page: Stages and resources for standards development

(*) As of 2022-06-30, CD ballots have been removed and replaced by CD Consultation. DTR, DTS and DPAS are now managed at stage 50 but the audience remains the same (i.e. P-members must vote and O-members can comment).

Update on open standards

10.2. Active Work Items (without IS under Systematic Review)

WG	Reference	Document title	Reg. date	Crnt stage	Stage date	Limit date	Time frame	Secretariats remark
4	ISO/CD 12636	Graphic technology — Blankets for offset printing	2023-11-06	30.00	2025-09-04	2025-11-06	36	SDT 9-month extension
2	ISO/AWI 12642-4	Graphic technology — Input data for characterization of four-colour process printing — Part 4: Extended data set including 7 colours	2025-08-25	20.00	2025-08-25	2027-08-25	36	Project under development
3	ISO/CD 12647-2	Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes	2025-10-31	30.00	2025-10-31	2027-10-31	36	CD preparation
3	ISO/AWI 12647-10	Graphic technology — Process control for the production of half-tone colour separations, proofs and production prints — Part 10: Packaging Rotogravure printing	2025-05-16	20.00	2025-05-16	2027-05-16	36	Project under development
3	ISO/CD 15339-2	Graphic technology – Printing from digital data across multiple technologies — Part 2: Characterized reference printing conditions	2024-04-18	30.60	2025-09-13	2026-04-18	36	Resolving CD comments
14	ISO/AWI TS 18621-31	Graphic technology — Image quality evaluation methods for printed matter — Part 31: Evaluation of the perceived resolution of printing systems with the Contrast–Resolution chart	2024-04-29	20.00	2024-04-29	2027-04-29	36	Project under development
13	ISO/AWI 19302	Graphic technology — Colour conformity of printing workflows	2025-08-28	20.00	2025-08-28	2027-08-26	36	Project under development
13	ISO/CD 19303-1.2	Graphic technology — Print Manufacturing, requirements and guidelines — Part 1: Packaging printing supply chain	2024-03-11	30.60	2025-05-17	2026-03-11	36	Resolving CD comments

WG	Reference	Document title	Reg. date	Crnt stage	Stage date	Limit date	Time frame	Secretariats remark
3	ISO/DIS 19307	Graphic Technology — Measurement and one-parameter representation of translucency	2023-07-24	40.00	2025-07-22	2026-07-24	36	ISO/CS processing + DIS ballot preparation
11	ISO/AWI 19311.2	Graphic technology — Environmental sustainability assessment reporting	2025-10-23	20.00	2025-10-30	2026-06-23	18	Project under development
4	ISO/CD TR 19312	Graphic Technology – Method for predicting print image quality of prints from high-speed inkjet printing system from combinations of paper properties	2024-09-09	30.60	2025-04-10	——	——	Resolving CD comments
4	ISO/CD 19313	Graphic technology — Colour and transparency of printing ink sets for seven-colour offset printing	2024-11-13	30.20	2025-08-26	2025-11-13	24	CD consultation initiated
4	ISO/AWI 19314	Graphic technology — Test method for Determination of print through	2025-02-07	20.00	2025-02-07	2026-02-07	24	Project under development
12	ISO/WD 19315	Graphic technology --Flatbed die cutting, creasing and scoring on paper and paper board	2025-05-15	20.60	2025-07-09	2027-05-15	36	Resolving Working Draft (WD) Study comments
2	ISO/CD 19593-1.2	Graphic technology — Use of PDF to associate processing steps and content data — Part 1: Processing steps for packaging and labels	2024-10-09	30.60	2025-08-07	2027-07-09	EXTENDED	Resolving CD comments
2	ISO/CD 21812-1	Graphic technology — Print product metadata for PDF files — Part 1: Architecture and core requirements for metadata	2025-04-28	30.00	2025-04-28	2027-04-28	36	CD preparation
11	ISO/PRF 22067-2	Graphic technology — Requirements for communication of environmental aspects of printed products — Part 2: Print finishing	2024-04-18	50.00	2025-10-28	2027-04-18	36	ISO/CS processing + Direct publication preparation

WG	Reference	Document title	Reg. date	Crnt stage	Stage date	Limit date	Time frame	Secretariats remark
11	ISO/AWI 22067-3	Graphic technology -- Requirements for communication of environmental aspects of printed products — Part 3: Textile printing	2025-10-20	10.99	2025-10-20	2026-10-20	24	Project under development
7	ISO/DIS 23564	Image technology colour management — Evaluating colour transform accuracy in ICC profiles	2023-11-07	40.00	2025-09-15	2026-11-07	36	ISO/CS processing + DIS ballot preparation

10.3. Number of on-going and possible new projects of ISO/TC 130 sorted by Working Groups

Status	WG1	WG2	WG3	WG4	WG5	JWG7	WG9	WG10	WG11	WG12	WG13	JWG 14	TF 3	TC130
Preliminary WI	2		1						0	1				4
Active WI		3	4	4		1			3	1	2	1		19
Projects under Review 2025		7	5	2		1					1	1		17
Projects under Review 2025/2026		1	1	1										3

TC/130 ISO Standards progress thru 2025!

SUSTAINABLE DEVELOPMENT GOALS

This committee contributes with 85 standards to the following Sustainable Development Goals:

3 4 6 8 9 12 13

110
Published ISO standards *

20
ISO standards under development *

21
Participating members

23
Observing members

Update on 12647-2!

- Can anyone tell me why this standard is so relevant in our Printing Process?

  It is the main Standard for Press Alignment of Offset, that allows other Print Methodologies to also target at it's tolerances and aims!

- When was the last time it was updated?

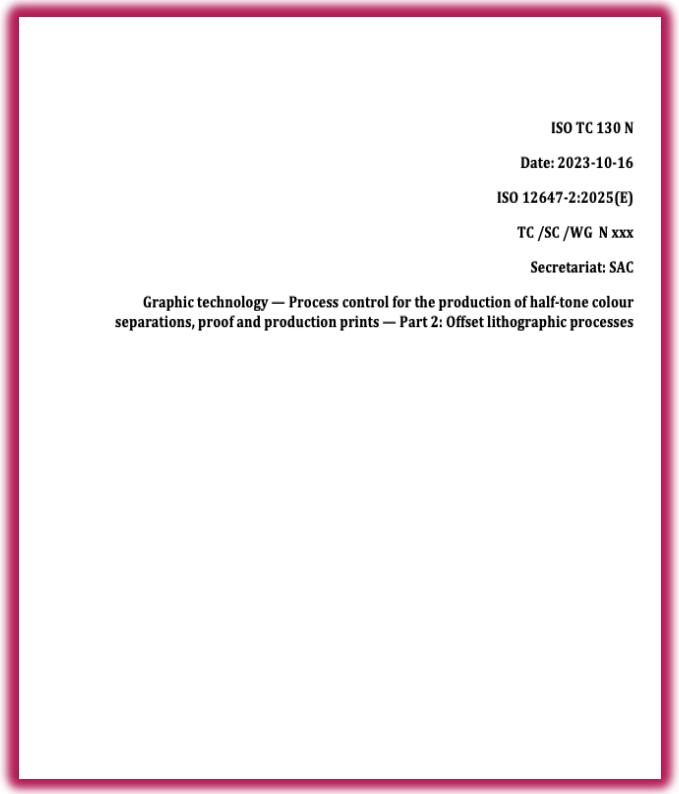
  We started working on this as far back as 2013 updated, 2017 restarted another update. (One working on now)

- Has it ever contained more than one Alignment process for Print Calibration?

  No

- What are the methods of Alignment for an offset Press?

  TVI, CTV, NNC, NNC2



ISO TC 130 N

Date: 2023-10-16

ISO 12647-2:2025(E)

TC /SC /WG N xxx

Secretariat: SAC

Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes

Update 12647-2

Read sample

ISO 12647-2:2013

Graphic technology — Process control for the production of half-tone colour separations, proof and production prints

Part 2: Offset lithographic processes

Published (Edition 3, 2013)

Standards Sectors About ISO Insights & news Taking part

Abstract

ISO 12647-2:2013 specifies a number of process parameters and their values to be applied when producing colour separations, printing formes and print production for four-colour sheet-fed and web-fed offset printing presses excluding coldset offset lithography on newsprint.

The parameters and values are chosen in view of the typical process covering the process stages "colour separation", "proof production", "making of the printing forme", "OK print" and "production printing" on all kinds of commercially available production substrates.

ISO 12647-2:2013:

is directly applicable to press proof prints and printing processes that use colour separation printing formes as input;

is applicable to press proof prints and printing processes with more than four process colours as long as direct analogies to four-colour printing are maintained, such as for data and screening, for print substrates and printing parameters;

is applicable to printing on cardboard material for packaging;

is applicable for all kinds of drying methods such as heat-set, infrared, and ultraviolet;

provides references for quality assurance and quality management.

Update on 12647-2!

After many years of US petitioning and massive worldwide G7 adoption

Resolution 714

ISO/TC 130 resolves, at the request of WG 3, to launch an 8-week CIB ballot for the decision **to revise ISO 12647-2** "*Graphic technology—Process control for the production of half-tone colour separations, proof and production prints—Part 2: Offset lithographic processes*" **to incorporate the near-neutral process control method as an alternative method to the existing equal TVI method.**

[Background statement: **In the ISO/TC 130/WG 3 Tokyo meeting, the WG members reached consensus that the widely used near-neutral method should have an equivalent status with the TVI method** (as specified in ISO 12647).]

ISO TC 130 finally agrees to include "Near Neutral" in ISO 12647-2 as alternative to TVI

Update 12647-2 / (What's New!)

This document was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

This fourth edition cancels and replaces the third edition (ISO 12647-2:2013), which has been technically revised.

The main changes are as follows:

— inclusion of control mode for near-neutral calibration method;

— inclusion of control mode for CTV as an alternative to density-based TVI calibration;

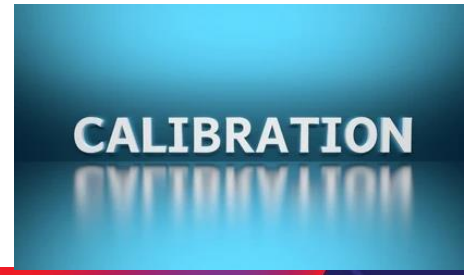
— specification of measuring conditions;

— changes in printing conditions, namely their count and some changes in the colouration of the primary and secondary solids;

— introduction of new tone value increase curves only dependant on paper surface and harmonized for TVI and near-neutral calibration method;

— and general clean up.

A list of all parts in the ISO 12647 series can be found on the ISO website.



Update 12647-2 / (What's New!)

6 Press calibration

The calibration process is out of scope for this standard, however, it is assumed that prior to printing the press has been well maintained and calibrated using best practice, ensuring that all tone scales are smooth and are within tolerance for the complete range specified for the calibration method used.

The calibration method used (TVI, CTV or NNC) shall be reported and the control strip should include highlight, midtown, shadow patches and shall include a midtown patch to control the validity of the calibration. Where possible the patch values should be selected from 25, 50, 75.

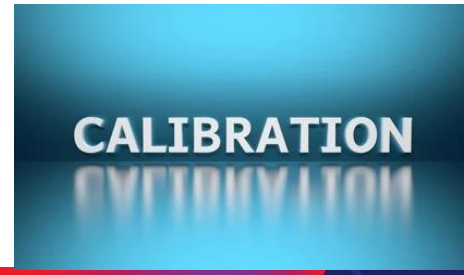
To broaden the range of calibration options supported, two CIELAB-based calibration methods are introduced as an alternative to density-based tone value calibration: colour tone value (CTV) for single colour patches and near-neutral CIELAB measurements for specified CMY combinations and for K separations. While the CTV method takes up the idea of ISO 20654 (SCTV) to provide a colorimetric alternative to density based TVI, the near-neutral method represents a grey balance approach.

To allow more flexibility three classes of printing conditions are defined:

— Native: printing conditions as defined in this document,

— Registered: printing conditions as published at www.color.org,

— Relative: use of a native or registered printing condition with substrate compensation correction applied.



Update 12647-2 (What's New!)

Added Tolerances for the Near Neutral Calibration Process

- Paper LAB and when to look to SCCA
- Black L* (100)
- CMY L* (100)
- CMY a*b* (100)

This provides aims for those who are "not in the art of NNC" can have Deviation and Variation Tolerances.

Table 1 — Tolerances

Substrate	Combined deviation and variation tolerance	
CIELAB Color difference ΔL* / Δa* / Δb*	±3 / ±2 / ±2	
Solid colours	Deviation tolerance	Variation tolerance
Colour aim (Black) *L*, a*, b**	$\Delta E^*_{ab} \leq 5$	$\Delta E^*_{ab} \leq 4$
Colour aim (Cyan) *L*, a*, b**	$\Delta E^*_{ab} \leq 5$	$\Delta E^*_{ab} \leq 4$
Colour aim (Magenta) *L*, a*, b**	$\Delta E^*_{ab} \leq 5$	$\Delta E^*_{ab} \leq 4$
Colour aim (Yellow) *L*, a*, b**	$\Delta E^*_{ab} \leq 5$	$\Delta E^*_{ab} \leq 4$
TVI and ΔCTV Calibration	Deviation	Variation
TVI for *0 to < 30 (%);* alternatively, ΔCTV	±3	±3
TVI for *30 to 70 (%);* alternatively, ΔCTV	±4	±4
TVI for *> 70 (%);* alternatively, ΔCTV	±3	±3
Maximum mid-tone spread (CMY)	≤ 5	≤ 5
Near Neutral Calibration (NNC)	Deviation	Variation
Black *L* (25)*	$\Delta L^* \leq \pm 2$	$\Delta L^* \leq \pm 2$
Black *L* (50)*	$\Delta L^* \leq \pm 3$	$\Delta L^* \leq \pm 3$
Black *L* (75)*	$\Delta L^* \leq \pm 4$	$\Delta L^* \leq \pm 4$
Black *L* (100)*	$\Delta L^* \leq \pm 5$	$\Delta L^* \leq 5$
CMY *L* (25)*	$\Delta L^* \leq \pm 2$	$\Delta L^* \leq \pm 2$
CMY *L* (50)*	$\Delta L^* \leq \pm 3$	$\Delta L^* \leq \pm 3$
CMY *L* (75)*	$\Delta L^* \leq \pm 4$	$\Delta L^* \leq \pm 4$
CMY *L* (100)*	$\Delta L^* \leq \pm 5$	$\Delta L^* \leq \pm 5$
CMY *a*, b* (25)*	$\Delta C_h \leq \pm 2$	$\Delta C_h \leq \pm 2$
CMY *a*, b* (50)*	$\Delta C_h \leq \pm 3$	$\Delta C_h \leq \pm 3$
CMY *a*, b* (75)*	$\Delta C_h \leq \pm 4$	$\Delta C_h \leq \pm 4$
CMY *a*, b* (100)*	$\Delta C_h \leq \pm 5$	$\Delta C_h \leq \pm 5$

NOTE 1 Tolerances are now provided for NNC / NNC2 Black Solid L* , CMY L* and CMY a* and B*

Update 12647-2 (What's New!)

New!

Example of a Print Condition or "PC" as listed in the document! For all 12 PC's!

PC1 Paper has been shifted to a -6b*

New are CTV and NNC metrics for each calibration process!

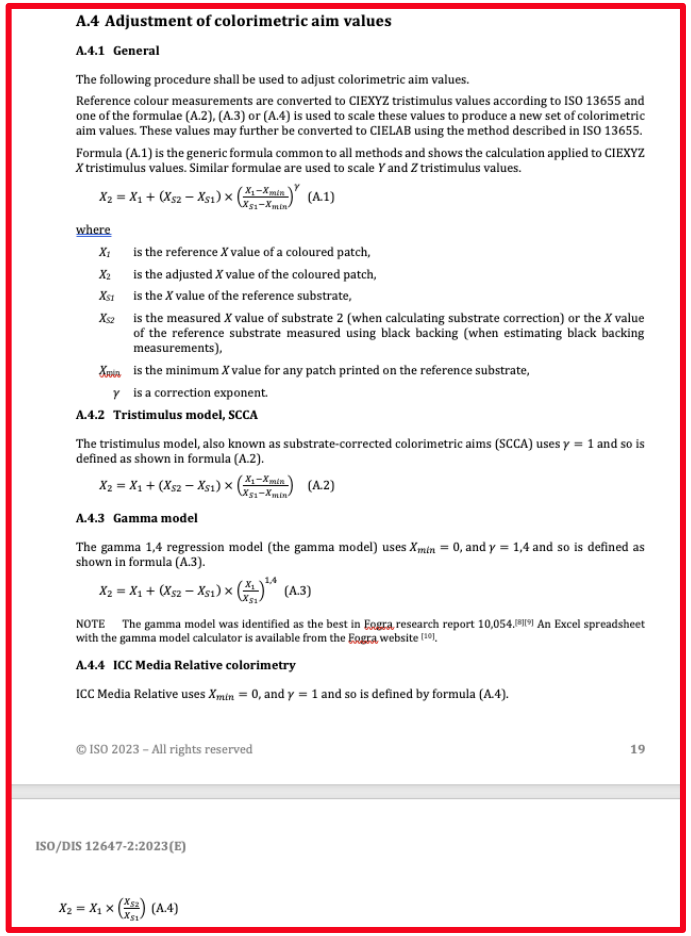
Table 2 — Native standard printing condition PC1 to PC3

Printing condition identifier			PC1				PC2				PC3			
Common requirements		Measurement condition	M1				M1				M1			
		Typical process	Sheet-fed offset Heat-set web offset				Heat-set web offset				Heat-set web offset			
	Print substrate	Type of surface	Premium coated				Improved coated				Standard glossy coated			
		Gloss range	10 to 80				25 to 65				60 to 80			
		Fluorescence	moderate				low				low			
		Fluorescence range	8 to 14				4 to 8				4 to 8			
			L*	a*	b*		L*	a*	b*		L*	a*	b*	
		Colour L*, a*, b*	95	1	-6		93	0	-1		90	0	1	
	Colour aim (White backing)		L*	a*	b*		L*	a*	b*		L*	a*	b*	
		Black	16	0	0		20	1	2		20	1	2	
		Cyan	56	-35	-53		58	-37	-46		55	-36	-43	
		Magenta	48	75	-5		48	73	-6		46	70	-3	
		Yellow	89	-4	92		87	-3	90		84	-2	89	
		(Red M + Y)	48	69	46		48	66	45		47	64	45	
		(Green C + Y)	49	-66	24		51	-59	27		49	-56	28	
		(Blue C + M)	25	21	-47		28	16	-46		27	15	-42	
		(C + M + Y solid)	23	0	0		28	-4	-1		27	-3	0	
TVI or ΔCTV calibration aims	TVI		K	C	M	Y	K	C	M	Y	K	C	M	Y
		25%	14,0	12,2	12,2	12,2	15,8	15,8	15,8	15,8	15,8	15,8	15,8	15,8
		50%	17,5	16,0	16,0	16,0	19,0	19,0	19,0	19,0	19,0	19,0	19,0	19,0
		75%	14,0	12,7	12,7	12,7	14,1	14,1	14,1	14,1	14,1	14,1	14,1	14,1
	ΔCTV	25%	-5,5	0,1	0,1	-1,6	-2,5	0,2	0,2	-1,3	0,2	-1,1	-2,3	0,2
		50%	-9,3	1,1	0,8	-2,1	-3,5	1,7	2,0	-0,5	2,0	-0,1	-3,2	1,8
		75%	-8,3	3,2	2,6	-0,1	-2,5	3,2	3,8	1,5	3,6	1,9	-2,1	3,1
Near neutral calibration aims	Black		L*				L*				L*			
		25%	78,50				75,91				73,38			
		50%	61,50				58,90				56,90			
		75%	40,50				40,46				39,20			
	CMY		L*	a*	b*		L*	a*	b*		L*	a*	b*	
		25% CMY 25/18.88/18.88	75,50	0,75	-4,50		73,86	0,00	-0,75		71,39	0,00	0,75	
		50% CMY 50/40/40	57,40	0,50	-3,00		56,77	0,00	-0,50		54,80	0,00	0,50	
		75% CMY 75/66.12/66.12	39,40	0,25	-1,50		40,83	-0,25	-0,31		39,37	-0,19	0,25	

Update 12647-2 (What's New!)

Annex A now has **three SCCA** formulas to choose from!

1. Tristimulus model, SCCA
2. Gamma model
3. ICC Media Relative Colorimetry



Annex A
(normative)

Colorimetric aim value adjustment

A.4 Adjustment of colorimetric aim values

A.4.1 General

The following procedure shall be used to adjust colorimetric aim values.

Reference colour measurements are converted to CIEXYZ tristimulus values according to ISO 13655 and one of the formulae (A.2), (A.3) or (A.4) is used to scale these values to produce a new set of colorimetric aim values. These values may further be converted to CIELAB using the method described in ISO 13655.

Formula (A.1) is the generic formula common to all methods and shows the calculation applied to CIEXYZ X tristimulus values. Similar formulae are used to scale Y and Z tristimulus values.

$$X_2 = X_1 + (X_{S2} - X_{S1}) \times \left(\frac{X_1 - X_{min}}{X_{S1} - X_{min}}\right)^{\gamma} \quad \text{(A.1)}$$

where

X_1 is the reference X value of a coloured patch,

X_2 is the adjusted X value of the coloured patch,

X_{S1} is the X value of the reference substrate,

X_{S2} is the measured X value of substrate 2 (when calculating substrate correction) or the X value of the reference substrate measured using black backing (when estimating black backing measurements),

X_{min} is the minimum X value for any patch printed on the reference substrate,

γ is a correction exponent.

A.4.2 Tristimulus model, SCCA

The tristimulus model, also known as substrate-corrected colorimetric aims (SCCA) uses $\gamma = 1$ and so is defined as shown in formula (A.2).

$$X_2 = X_1 + (X_{S2} - X_{S1}) \times \left(\frac{X_1 - X_{min}}{X_{S1} - X_{min}}\right) \quad \text{(A.2)}$$

A.4.3 Gamma model

The gamma 1,4 regression model (the gamma model) uses $X_{min} = 0$, and $\gamma = 1{,}4$ and so is defined as shown in formula (A.3).

$$X_2 = X_1 + (X_{S2} - X_{S1}) \times \left(\frac{X_1}{X_{S1}}\right)^{1,4} \quad \text{(A.3)}$$

NOTE The gamma model was identified as the best in Fogra research report 10,054.[8][9] An Excel spreadsheet with the gamma model calculator is available from the Fogra website [10].

A.4.4 ICC Media Relative colorimetry

ICC Media Relative uses $X_{min} = 0$, and $\gamma = 1$ and so is defined by formula (A.4).

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$$X_2 = X_1 \times \left(\frac{X_{S2}}{X_{S1}}\right) \quad \text{(A.4)}$$

Update 12647-2 / UCDv4

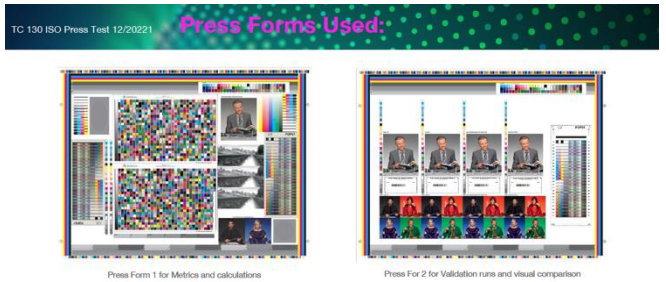
- Who here knows what UCD stand for?
  Universal Characterization Dataset!

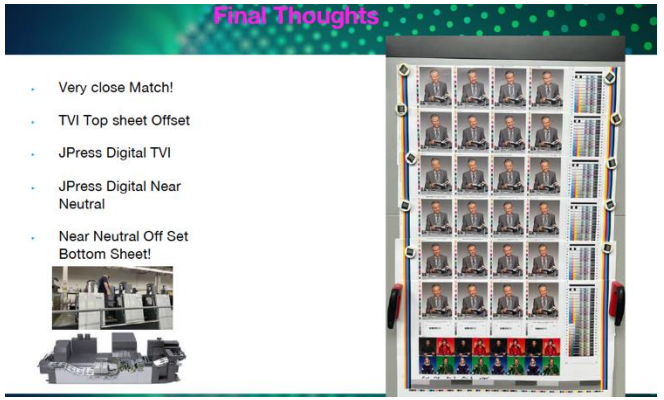
- Why is this important to this standard?
  Because if you're updating a Standard in 2026, we need to finally align the "Color Space" for Universal Color alignment for the World-Wide Print Industry!

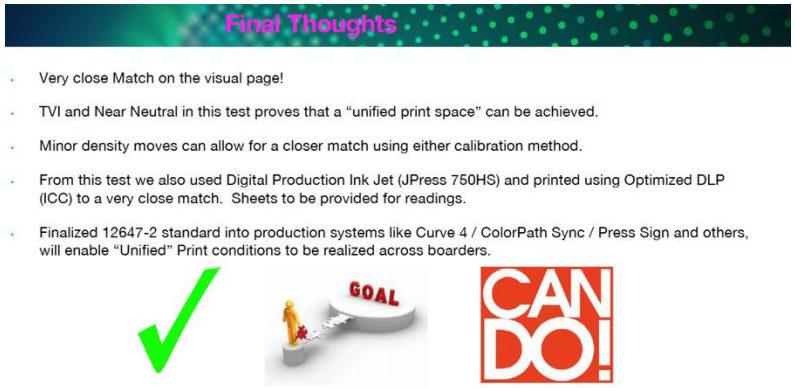
- Why do we need a Universal Characterization Dataset?
  Designers, Agencies, Brands, Printers, Vendors, Consultants can work off a single "Color Space" and not have to try and make CRPC6, Fogra 51, J Color, or any other CRPC align in the methods used today!

Update 12647-2 / UCDv4

- UCD was started in 2019 by ISO TC/130 WG3
- Datasets from around the world were reviewed and managed to create a single UCD Candidate!
- In 2022 the first UCDV1 test was performed around the world. The USA participated and created TVI, NNC, and Digital sheets to include proofs for the review in England!

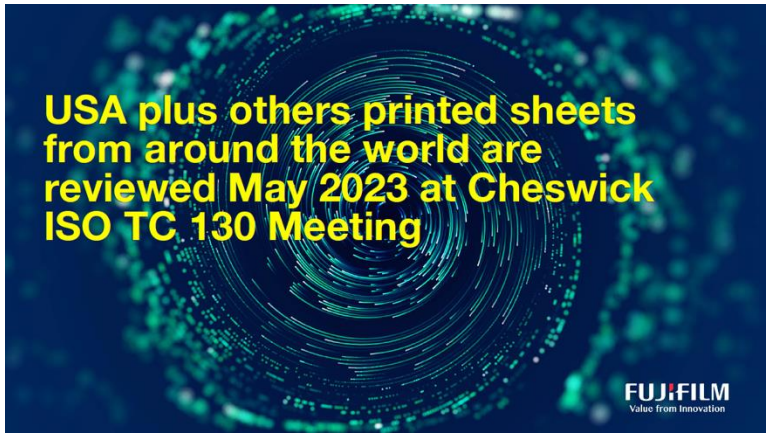






Update 12647-2 / UCDv4

- Sheets from three counties are reviewed in Cheswick England May 2023
- Images were cut out and placed on a table with the various methods of TVI and NNC to the UCDv1. All users had a very difficult time telling one from another!
- The next test was agreed to include 5 countries and more samples to be reviewed in the Japan!



Update 12647-2 / UCDv4

- Sheets from Five counties are reviewed in Tokyo Japan November 2023
- This time full sheets were coded.
- Experts were asked again to tell what was TVI and what was NNC?
- Not one expert could tell the correct alignment method!

Update 12647-2 / UCDv4

- In Tokyo it was decided that Don S would write the “How To” to perform a World-Wide Beta of the UCD at the user level.
- From my reports up to this point, can you imagine if this could be pulled off! Yes we did!
- 2024 was a big year for news and updates
- This slowed the Development of 12647-2 and UCD based on confusion of the addition of a new method to do NNC
- After many months of discussions, we got back to work!

Next Steps Prior to ISO May 2024 Meetings

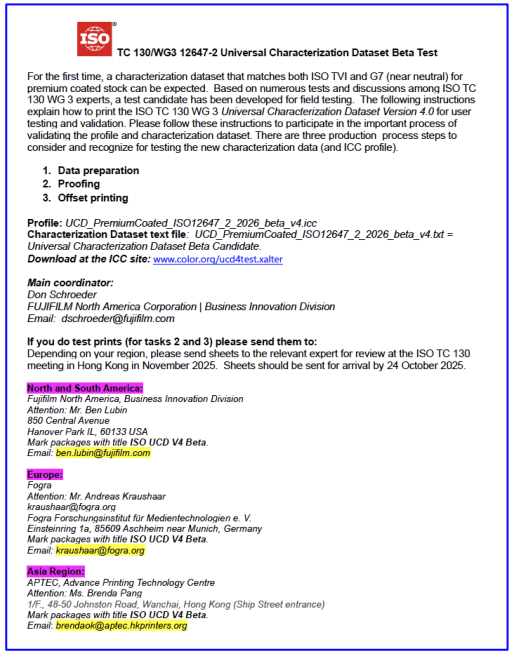
- Don Schroeder and Mike Whelpley to lead the write up How To: for testing this version of the new UCD
- Include a short write up on method and dates required for submission to? Hopefully PPC… for USA
- Sections to include:
  - Setting up you separations for UCD
  - Proofing using UCD
  - Printing using UCD
- This will be used around the world and hopefully users will participate, Proof and Print and send sheets for the TC 130 Group to use for the May ISO TC 130 Meeting
- Will discuss with Don, Ron and my team on going back to press for G7 to Gracol 2013 and G7 to UCD and G7 Plus to UCD to get visuals and data to confirm the recent expectations of G7 and G7 Plus to PC 1 and that the math is Spot on!

Can you imagine!

- Having a single “Harmonious” Universal Characterization Data Set agreed by experts around the world to be “Spot On”!!
- Many experts before us tried, and on the backs of their hard work, we have never been closer
- Concessions on both sides have been made!
- We finally can go to Adobe with a Unified Characterization Data Set and hopefully Profile to embed in their solution for users to use around the world!
- Thanks and that’s all!

Update 12647-2 / UCDv4

- In early 2025 it was becoming evident that the ISO time to have the document open for edits and updates was getting close.
- It was decided to keep moving forward with the UCD but the ISO 12647-2 would have to be closed then reopened as as new work item.
- Luckily, we were able to re-open the document right where we left off not having to restart from scratch!
- The “How to” was completed early summer 2025 and sent out to all delegations!



TC 130/WG3 12647-2 Universal Characterization Dataset Beta Test

For the first time, a characterization dataset that matches both ISO TVI and G7 (near neutral) for premium coated stock can be expected. Based on numerous tests and discussions among ISO TC 130 WG 3 experts, a test candidate has been developed for field testing. The following instructions explain how to print the ISO TC 130 WG 3 *Universal Characterization Dataset Version 4.0* for user testing and validation. Please follow these instructions to participate in the important process of validating the profile and characterization dataset. There are three production process steps to consider and recognize for testing the new characterization data (and ICC profile).

1. **Data preparation**
2. **Proofing**
3. **Offset printing**

Profile: *UCD_PremiumCoated_ISO12647_2_2026_beta_v4.icc*
Characterization Dataset text file: *UCD_PremiumCoated_ISO12647_2_2026_beta_v4.txt = Universal Characterization Dataset Beta Candidate.*
Download at the ICC site: www.color.org/ucd4test.xalter

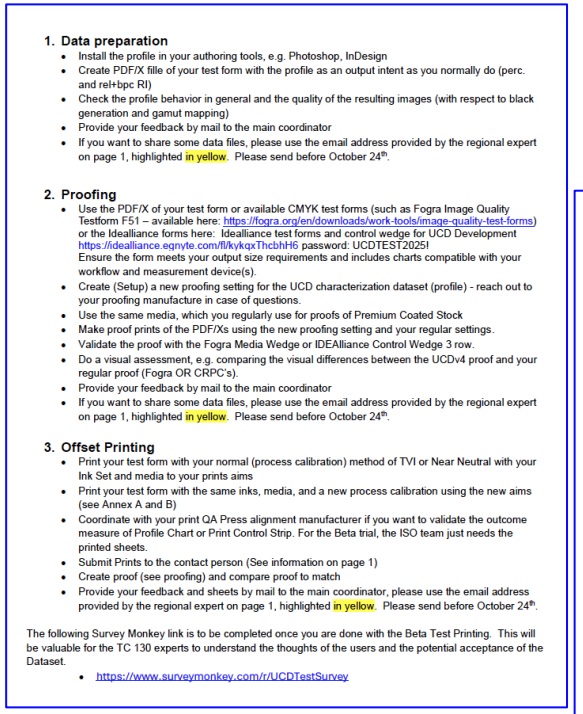
Main coordinator:
Don Schroeder
FUJIFILM North America Corporation | Business Innovation Division
Email: dschroeder@fujifilm.com

If you do test prints (for tasks 2 and 3) please send them to:
Depending on your region, please send sheets to the relevant expert for review at the ISO TC 130 meeting in Hong Kong in November 2025. Sheets should be sent for arrival by 24 October 2025.

North and South America:
Fujifilm North America, Business Innovation Division
Attention: Mr. Ben Lubin
850 Central Avenue
Hanover Park IL, 60133 USA
*Mark packages with title **ISO UCD V4 Beta**.*
Email: ben.lubin@fujifilm.com

Europe:
Fogra
Attention: Mr. Andreas Kraushaar
kraushaar@fogra.org
Fogra Forschungsinstitut für Medientechnologien e. V.
Einsteinring 1a, 85609 Aschheim near Munich, Germany
*Mark packages with title **ISO UCD V4 Beta**.*
Email: kraushaar@fogra.org

Asia Region:
APTEC, Advance Printing Technology Centre
Attention: Ms. Brenda Pang
1/F., 48-50 Johnston Road, Wanchai, Hong Kong (Ship Street entrance)
*Mark packages with title **ISO UCD V4 Beta**.*
Email: brendaok@aptec.hkprinters.org



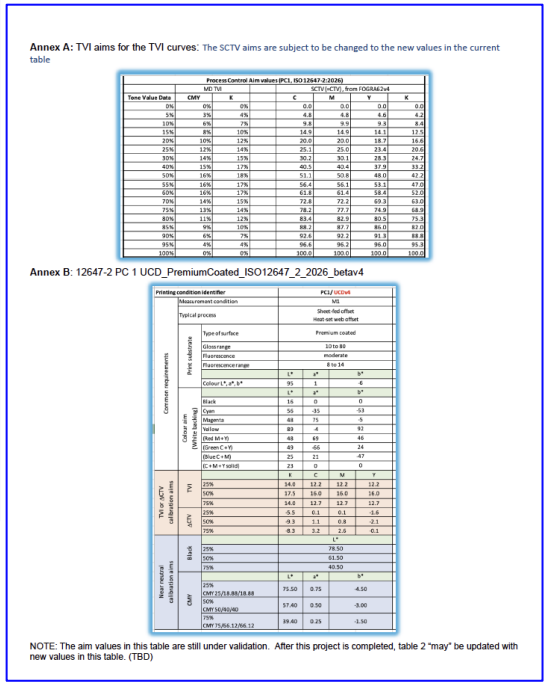
1. Data preparation
- Install the profile in your authoring tools, e.g. Photoshop, InDesign
- Create PDF/X fille of your test form with the profile as an output intent as you normally do (perc. and rel+bpc RI)
- Check the profile behavior in general and the quality of the resulting images (with respect to black generation and gamut mapping)
- Provide your feedback by mail to the main coordinator
- If you want to share some data files, please use the email address provided by the regional expert on page 1, highlighted in yellow. Please send before October 24th.

2. Proofing
- Use the PDF/X of your test form or available CMYK test forms (such as Fogra Image Quality Testform F51 – available here: https://fogra.org/en/downloads/work-tools/image-quality-test-forms) or the Idealliance forms here: Idealliance test forms and control wedge for UCD Development https://idealliance.egnyte.com/fl/kykqxThcbhH6 password: UCDTEST2025! Ensure the form meets your output size requirements and includes charts compatible with your workflow and measurement device(s).
- Create (Setup) a new proofing setting for the UCD characterization dataset (profile) - reach out to your proofing manufacture in case of questions.
- Use the same media, which you regularly use for proofs of Premium Coated Stock
- Make proof prints of the PDF/Xs using the new proofing setting and your regular settings.
- Validate the proof with the Fogra Media Wedge or IDEAlliance Control Wedge 3 row.
- Do a visual assessment, e.g. comparing the visual differences between the UCDv4 proof and your regular proof (Fogra OR CRPC's).
- Provide your feedback by mail to the main coordinator
- If you want to share some data files, please use the email address provided by the regional expert on page 1, highlighted in yellow. Please send before October 24th.

3. Offset Printing
- Print your test form with your normal (process calibration) method of TVI or Near Neutral with your Ink Set and media to your prints aims
- Print your test form with the same inks, media, and a new process calibration using the new aims (see Annex A and B)
- Coordinate with your print QA Press alignment manufacturer if you want to validate the outcome measure of Profile Chart or Print Control Strip. For the Beta trial, the ISO team just needs the printed sheets.
- Submit Prints to the contact person (See information on page 1)
- Create proof (see proofing) and compare proof to match
- Provide your feedback and sheets by mail to the main coordinator, please use the email address provided by the regional expert on page 1, highlighted in yellow. Please send before October 24th.

The following Survey Monkey link is to be completed once you are done with the Beta Test Printing. This will be valuable for the TC 130 experts to understand the thoughts of the users and the potential acceptance of the Dataset.

- https://www.surveymonkey.com/r/UCDTestSurvey



Annex A: TVI aims for the TVI curves: The SCTV aims are subject to be changed to the new values in the current table

Process Control Aim values (PC1, ISO12647-2:2026)							
	M0: TVI		SCTV (=CTV) , from FOGRA62v4				
Tone Value Data	CMY	K	C	M	Y	K
0%	0%	0%	0.0	0.0	0.0	0.0
5%	3%	4%	4.8	4.8	4.6	4.2
10%	6%	7%	9.8	9.9	9.3	8.4
15%	8%	10%	14.9	14.9	14.1	12.5
20%	10%	12%	20.0	20.0	18.7	16.8
25%	12%	14%	25.1	25.0	23.4	20.6
30%	14%	15%	30.2	30.1	28.3	24.7
40%	15%	17%	40.5	40.4	37.9	33.2
50%	16%	18%	51.1	50.8	48.0	42.2
55%	16%	17%	56.4	56.1	53.1	47.0
60%	16%	17%	61.8	61.4	58.4	52.0
70%	14%	15%	72.6	72.2	69.3	63.0
75%	13%	14%	78.2	77.7	74.9	68.9
80%	11%	12%	83.4	82.9	80.5	75.3
85%	9%	10%	88.2	87.7	86.0	82.0
90%	6%	7%	92.6	92.2	91.3	88.8
95%	4%	4%	96.6	96.2	96.0	95.3
100%	0%	0%	100.0	100.0	100.0	100.0

Annex B: 12647-2 PC 1 UCD_PremiumCoated_ISO12647_2_2026_betav4

Printing condition identifier			PC1 / UCDv4			
Common requirements		Measurement condition	M1			
		Typical process	Sheet-fed offset Web-set web offset			
	Print substrate	Type of surface	Premium coated			
		Gloss range	10 to 80			
		Fluorescence	moderate			
		Fluorescence range	0 to 14			
	Colour aim (White backing)		L*	a*		b*
		Colour L*, a*, b*	95	1		-6
			L*	a*		b*
		Black	16	0		0
		Cyan	56	-35		-53
		Magenta	48	75		-5
		Yellow	89	-4		93
		(Red M+Y)	48	69		46
		(Green C+Y)	49	-66		24
		(Blue C+M)	25	21		-47
		(C + M + Y solid)	23	0		0
			K	C	M	Y
TVI or SCTV calibration aims	TVI	25%	14.0	12.2	12.2	12.2
		50%	17.5	16.0	16.0	16.0
		75%	14.0	12.7	12.7	12.7
	SCTV	25%	-5.5	0.1	0.1	-1.6
		50%	-9.3	1.1	0.8	-2.1
		75%	-8.3	3.2	2.6	-0.1
Near-neutral characterization	Black		L*			
		25%	78.50			
		50%	61.50			
		75%	40.50			
	CMY		L*	a*		b*
		25% CMY 17/-3.8/-18.88	75.50	0.75		-4.50
		50% CMY 50/80/40	57.40	0.50		-9.00
		75% CMY 75/66.12/66.12	39.40	0.25		-1.50

NOTE: The aim values in this table are still under validation. After this project is completed, table 2 "may" be updated with new values in this table. (TBD)

Update 12647-2 / UCDv4

- The USA had 8 print locations print to the new UCD
- China had 3 locations
- France had 1 location
- Italy had 1 location

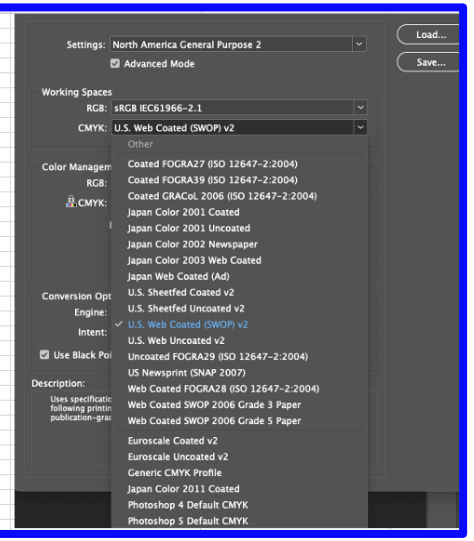
- All were reviewed in Hong Kong in late November 2025!
- Software used to test and Validate were:
  - Chromix Curve 4
  - Fujifilm ColorPath Sync Align
  - Alwan

- All sheets passed the 12647-2 tolerances and aims!
- Visuals were amazing and it was done on many stocks and some used SCCA as well!

Update 12647-2 / UCDv4

- So, where does this leave us now.
- UCDv4 is actively being reviewed for a new world-wide name!
- The Dataset is already entered into 15339-2!
- Testing is now completed for the UCD
- Now we must finish the ISO 12647-2 document!
- Next meeting set for France in April of this Year!
- More to come!

Region Expert	New name	Date	Vote	
Larry Warter USA	ISO Printing Colo(u)r standard	11/28/25	1	
Don Schroeder USA	Unified Coated Sheetfed (ISO 12647-2:2026)	11/28/25	1	
Don Schroeder USA	UCD Coated Sheetfed (ISO12647-2:2026)	11/28/25	2	KM,
Don Schroeder USA	WW Universal Coated Sheetfed (ISO 12647-2:2026)	11/28/25	1	
Ben Lubin USA	Global Coated Print Condition 1 (GCPC1)	11/28/25	1	FNAC USA,
Florian Suessl ECI / Germany	PSO Coated v4	12/11/25	1	Germany
Florian Suessl ECI / Germany	ISO Coated v4	12/11/25	1	Germany
Frans Gaykema	Coated Sheetfed UCD (ISO 12647-2:2026)	12/21/25	1	
Frans Gaykema	Coated Sheetfed UCD (ISO 12647-2:2026 PC1)	12/21/25	1	
Frans Gaykema	Coated Sheetfed UCD-CMYK (ISO 12647-2:2026)	12/21/25	1	
Frans Gaykema	Coated Sheetfed UCD-CMYK (ISO 12647-2:2026 PC1)	12/21/25	1	



CRPC	Substrate colour			Printed solid colours											
				Cyan			Magenta			Yellow			Black		
	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*	L*	a*	b*
1	85	1	5	59	-24	-26	56	48	0	80	-2	60	37	1	4
2	87	0	3	57	-28	-34	52	58	-2	82	-2	72	30	1	2
3	96	1	-4	60	-26	-44	56	61	-2	89	-3	76	32	1	1
3.5	96	1.5	-8	58	-25	-50	52	66	-1	91	-4	86	28	1	-2
4	89	0	3	55	-36	-38	47	66	-3	83	-3	83	23	1	2
5	92	0	0	57	-37	-44	48	71	-4	87	-4	88	19	0	1
6	95	1	-4	56	-37	-50	48	75	-4	89	-4	93	16	0	0
UCD	95	1	-6	56	-35	-53	48	75	-5	89	-4	92	16	0	0
PAK	93	0	0	55	-37	-46	47	73	-2	87	-5	92	16	0	0
7	97	1	-4	54	-42	-54	47	79	-10	90	-4	103	14	0	0

Moving forward! 12647-2 / UCDv4

UCD Benefits

- One global CMYK color space to rule them all
- Printing across borders without file conversions
- Major cost savings to brands and print buyers
- Major efficiency benefits to PSPs, pre-press, designers, (elves thanks DH!)
- Closely compatible with GRACoL / Fogra / G7 / G7+
- The 2003 Ghent Working Group challenge fulfilled at last!

"The GWG and the USA TC 130 Delegation has spent almost 25 years creating standards for blind exchange in print and packaging ... We are thrilled that a UCD will finally eliminate another roadblock to the standardization of print and packaging."

(David Zwang)

TAGA NextGen

ISO Standards and their Importance in the Print Communications Industry, Today and Moving Forward!

Don Schroeder, Senior Director, Solutions Development
Fujifilm Business Innovation Division