

## 2 Printing Standards development

Conditions for standardized,  
industrial print production

*Preview: Revision of ISO 12647  
Series (2012) – Proposals*

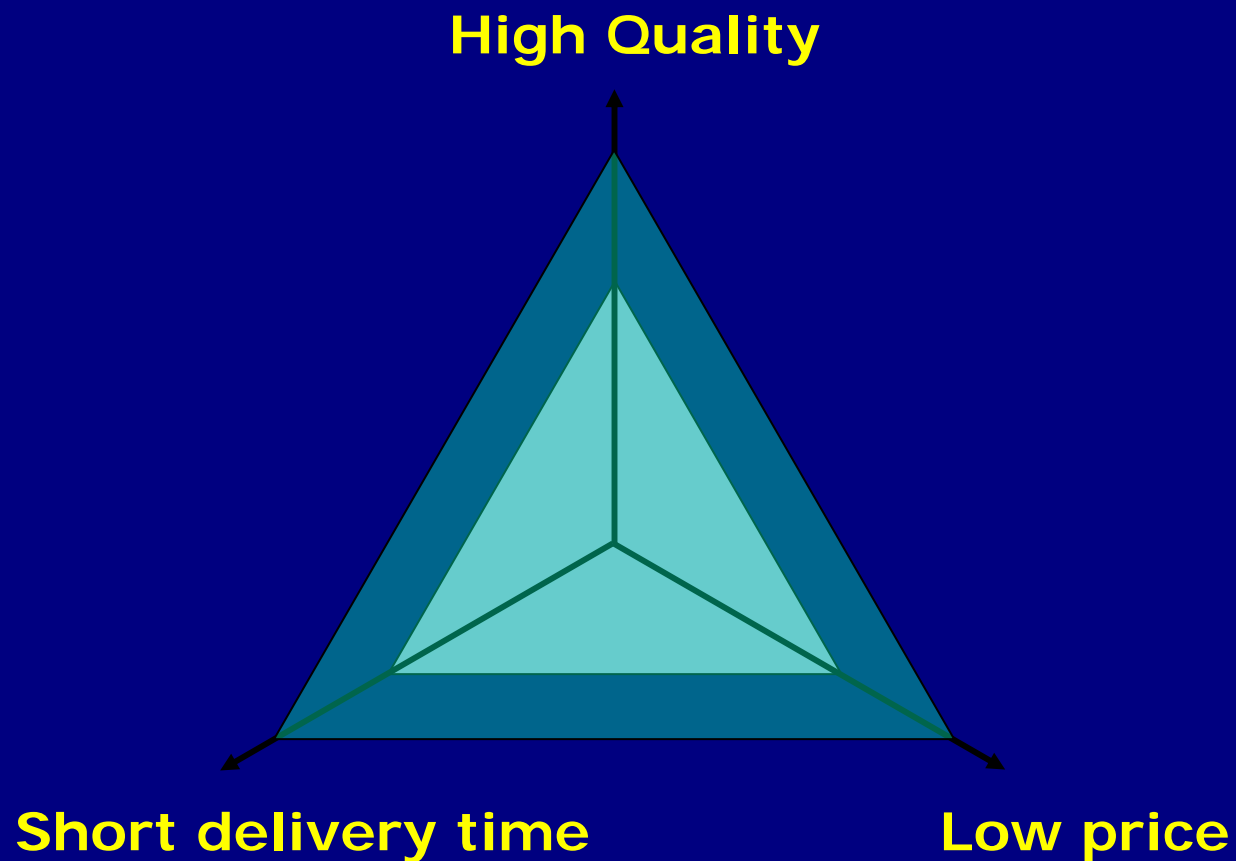
ISO TC 130 Meetings 2009 Ft.Worth, Beijing

## Trends: discussing future standardization

- *Reduction of tech. production tolerances ... again, again ...*
- *Introduction of additional standard/evaluation criteria*
- *Selective use of „shall“ and „should“*
- *„Pragmatism“ is beating methodology*
- *Driven by particular interests (e.g. print buyer, vendors ...)*
- *A new broom sweeps clean („process agnostic“ is not new)*
- *Certification, accreditation in first place ...*

***Original purpose of the standard (process control, print run) gets out of focus!***

# Dimensions of Quality



# Basic concept of ISO 12647

Printing condition



Printed result

ISO 12647

values of process parameters defined

Printing house

values of process parameters undefined

$$\begin{aligned}
 DE &= f(\text{PrC}) \\
 &= f(\text{PP}_d) + f(\text{PP}_u) \\
 &= f(\text{PP}_d) + \text{con.}
 \end{aligned}$$

Paper type (colour/coating)  
Printing Ink set (ISO 2846)  
Colour sequence  
Screening  
Printing plate copy



Black Box



Colour  $L^*$ ,  $a^*$ ,  $b^*$   
Primary-/ secondary colours  
Tone value A [%] primary colours  
Spread S [%] of primary colours CMY



„...without recourse to ,trial-and-error'...“

PrC = printing condition  
PP = process parameter  
d = defined  
u = undefined  
con. = constant, i.e. defined by printing house

# Process parameters of a printing condition in a printing house

fixed  
over many jobs

Paper product („company brand“)  
Printing Ink set (ISO 2846)  
Pressure plate/blanket  
Blanket type  
Cylinder ....  
Type of dampening solution  
CtP transfer curve  
ICC Profile  
...

variable  
from job to job

Paper product (customer request)  
Ink type (special requirement)  
Pressure plate/blanket  
...

variable  
during a job

Ink film thickness (zonal)  
Amount of additives  
Inking unit (temperature)  
....

De-Standardization = decreasing efficiency → „Crafts“

High Quality

High Quality

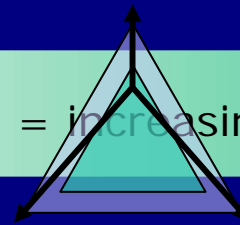
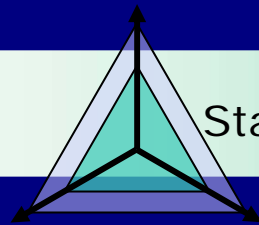
Standardization = increasing efficiency → Industry

delivery time

Low price

delivery time

low price



# Basic concept of ISO 12647

Printing condition

Printed result

## ISO 12647

values of process parameters defined

## Printing house

values of process parameters undefined

$$DE = f(PrC)$$

$$= f(PP_d) + f(PP_u)$$

$$= f(PP_d) + con$$

- Paper type (colour/coating)
- Printing Ink set (ISO 2846)
- Colour sequence
- Screening
- Printing plate copy

## Black Box

Parameter fixed over many jobs

Parameter variabel from job to job

Parameter variabel during a job

Colour L\*, a\*, b\*  
Primary-/ secondary colours

Tone value A [%] primary colours

Spreads [%] of primary colours CMY

PrC = printing condition  
PP = process parameter  
d = defined  
u = undefined  
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Level of Standardization going down

Level of Standardization going down



customer-/company-  
material-/...standard!

## Tolerances of measuring tools, Capability of measuring devices

*In general production* measuring devices (means) shall be used, which in comparison to tolerance of produced unit, show a negligible small measurement inaccuracy.

Measuring devices (means) are typically **considered capable**, if measurement inaccuracy is **max. 10% of tolerance**. Example: DE 5 (tol.) – DE 0,5 (inaccuracy).

**Print process control with available measuring devices (means) is NOT meeting these requirements.**

## Production: categories of processes (print jobs) in terms of standardization

***Standardized single jobs*** *Projects produced with standard settings without special requirements, fixed and defined workflows, automated job planning and estimating, no additional internal/external coordination necessary*

***Single jobs requiring many additional efforts*** *Very ambitious projects requiring comprehensive coordination and internal workflow set up, testing (product development), individual job planning, estimating, job definition*

***Periodicals, repetition of jobs*** *Technical production data to be used in principle unchanged. Established processes in job preparation and production*

# Standard requirements are always by definition minimum requirements

- *You are, of course, allowed to perform better*
- *However, this will be possible in only a very few cases*
- *ISO 12647 requirements are ambitious and rather challenging in daily print production (experience from many years, 600+ test prints, certifications)*
- *Standard requirements shall never be defined as the maximum (i.e. only possible under perfect conditions)*
- *Curve calibration, testing of material such as paper is not possible when printing typical jobs in a daily production. You can't just repeat 100 offset plates at the beginning of the print run of e.g. a catalogue production*

# Purpose of standards - ISO 12647

## Standardization and certification

- *Purpose of ISO 12647 is to enable predictable industrial print production (under typical technical and economical conditions)*
- *Standard requirements shall not be defined as the maximum (only possible under perfect conditions)*
- *Purpose of ISO 12647 is not to „police the printer“ or to force the print buyer (consultant) to do extensive measurements, check of results etc.*
- *Successful application of ISO 12647 at the printer means standardized, high-quality production on a daily basis*

# Purpose of standards - ISO 12647

## Standardization and certification

### *Requirements for systematic introduction and application of standardized production processes:*

- Check/update of all technical equipment (systems, devices)
- Check/update of staff skills, training and retraining
- Daily practice and improvement of process control
- Communication of quality standards (to customers, suppliers)
- Standardized, high-quality production on a daily basis
- Certification to ISO 12647 is a final, formal step (option)

*Priority 1: Standard application in production (need to have)*

Priority 2: Certification to the standard (nice to have)



# AUSGEZEICHNET

## ISO 12647-2



### HUTTER DRUCK

*Der Maßstab der Qualität.*



*... Certification is good for public relations*

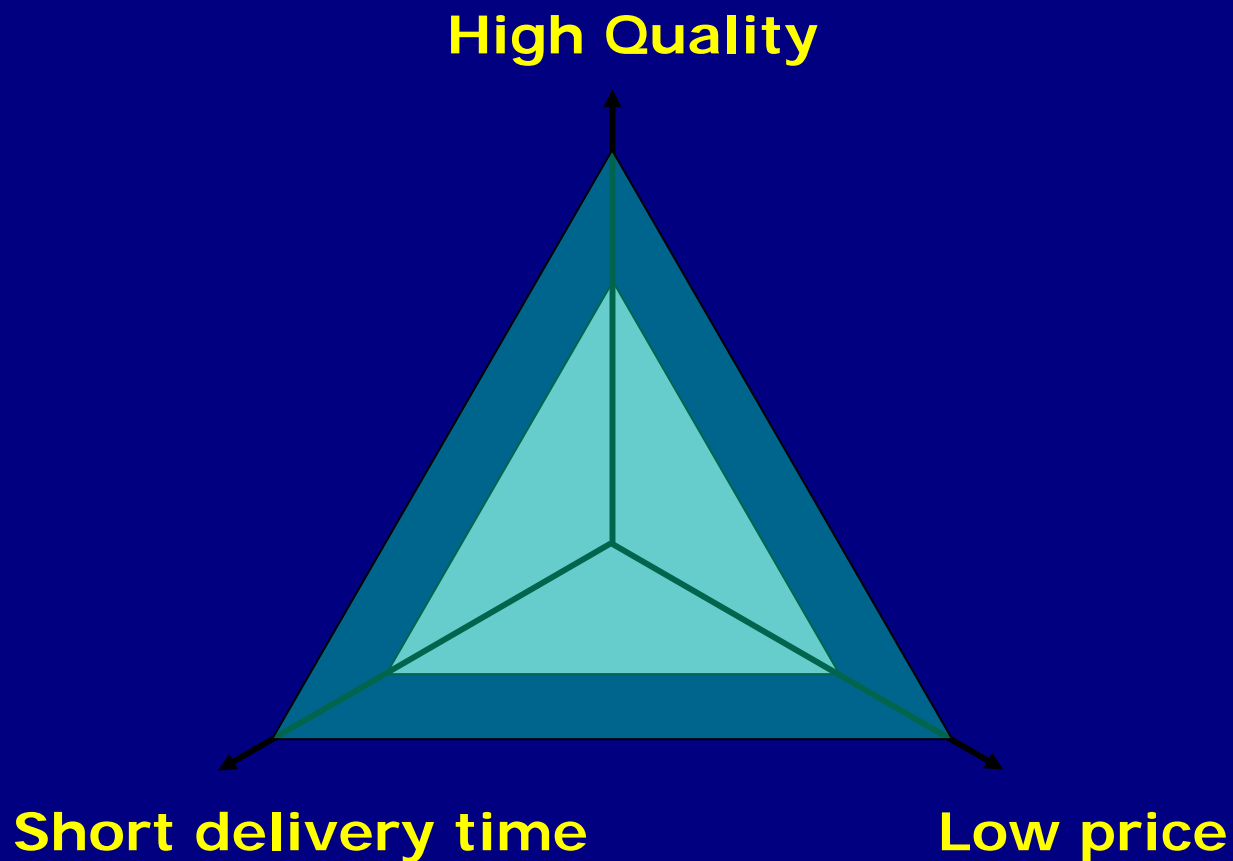
## Conclusion: ISO 12647 standard for industrial print production

*ISO 12647 does not represent maximum quality, but optimal industrial quality requirements*

- *technically performable by all companies working carefully with state of the art industry equipment*
- *checkable, verifiable results (measurements)*
- *with economically reasonable efforts (at given price)*
- *in an adequate time*
- *for the majority of jobs (accepted job quality)*

*There is always a 3-dimensional claim of print buyers: high quality, low price, short delivery time!*

# Dimensions of Quality



## *Preview (2012)*

# Revision of ISO 12647 Series – Proposal to ISO TC 130 WG 3

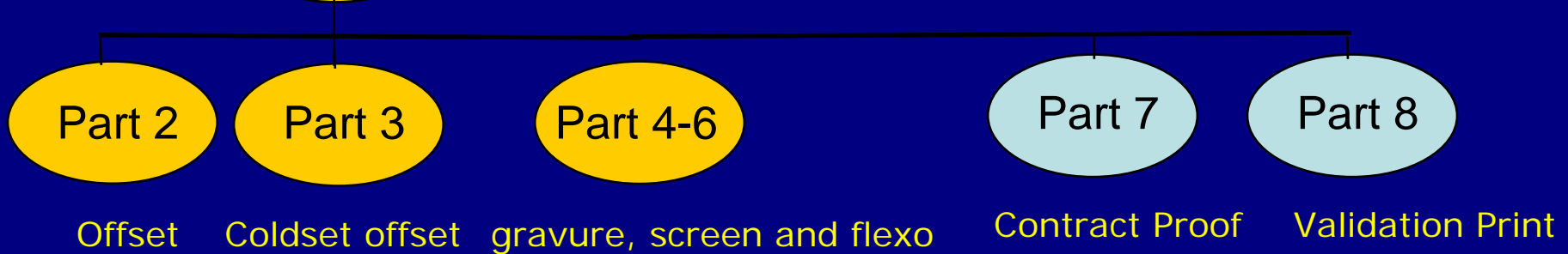
*Aims and Requirements for Revision*  
*ISO 12647 – A multipart Process Standard*  
*Updated Categorization of Printing Conditions [PrC]*  
*Updated Paper Category [PaC] Description*  
*Revision of ISO 12647-2 TVI Curves ...*

## Revision of ISO 12647 (2012) – Aims, Requirements

*Basics for standardization to be considered:*

- **Consistency - no ambiguity**  
only one standard, one principle for one field of application (process) - No changes of principles during standard lifetime
- **Stable over time - reliability**  
Users (printers, print buyers) and system manufacturers need time for standard communication, implementation into systems and workflows, successful standard application
- **No short-term changes of details**  
Only substantial changes and significant progress justifies a new standard edition - Avoid creation of amendments

# Part 1 ISO 12647 – A multipart Process Standard



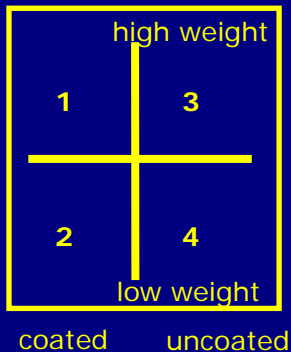
- Specific Printing Conditions
- Standard Requirements
- Conformance

Simulating a printing condition –  
“process agnostic”

- ISO 12647-1/2/3 have been used most intensively for many years
- ISO 12647-4/5/6 are in discussion or review phase
- Revision of parts 1-3 will be streamlined into the existing structure and discussed in concert with the revisions of part 4, 5 and 6
- ISO 12647-7 reliably established (Contract Proof)
- ISO 12647-8 (“Validation Print”) is actively debated - restricted to “single copy”

# Revision of ISO 12647-2 (2012) - Proposal: Updated categorization of printing conditions [PrC]

## Paper Category [PaC] Description



1. Coated papers [PaC 1]
2. Coated papers [PaC 2]
3. Uncoated papers [PaC 3]
4. Uncoated papers [PaC 4]

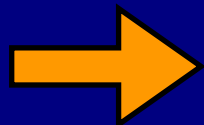
## TVI curve selection

1. regular screens
2. fine screens [NP]

## Process Control Aims\*

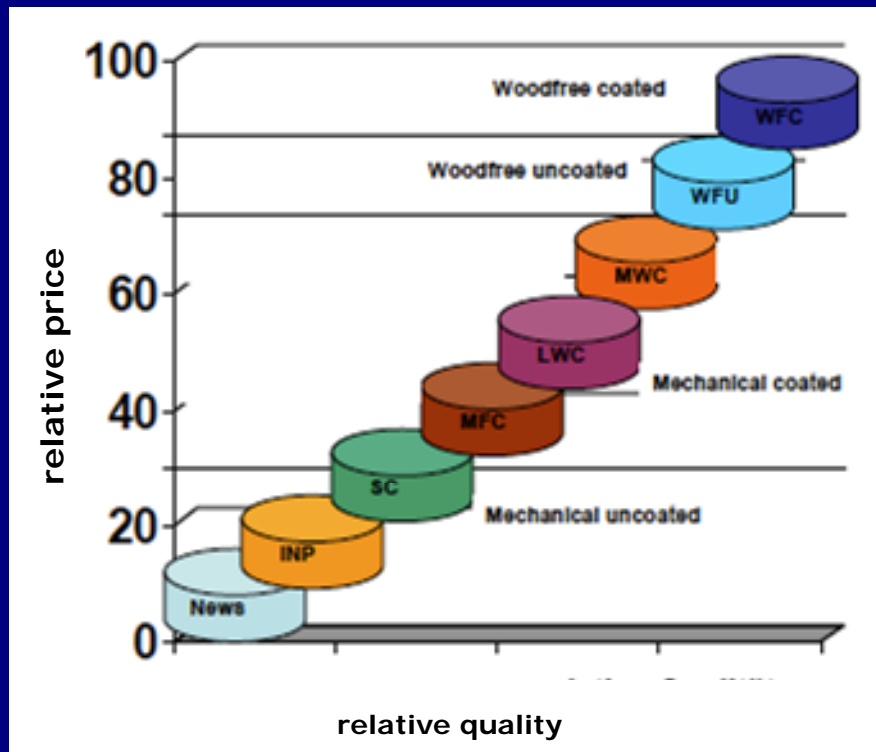


\* Fix printing sequence KCMY



1. There are 4 CMYK, RGB, CMY100, W solid colorations
2. There are 8 (4 paper types x 2 TVI settings) "spot on" specific PrC
3. There are many specific printing conditions (PrC) within tolerance

# Revision of ISO 12647-2 (2012) – Proposal: From “real paper” to ISO 12647-2 and Paper Categories



PaC 1

- Independent of any paper market trend

PaC 3

- Four aim values for typical representatives

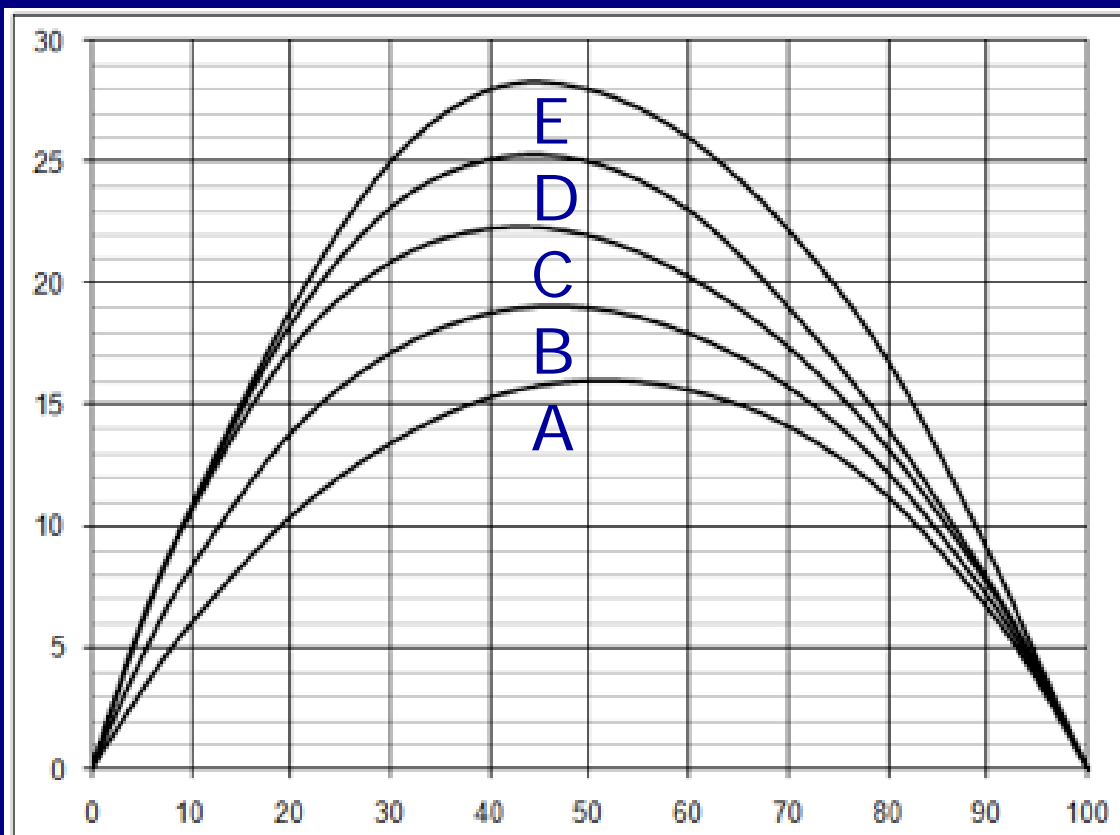
PaC 2

- remaining papers to be categorized within those four groups (e.g. with individual characterization data)

PaC 4

- dE of paper white will be moved to ink on paper coloration

**Revision of ISO 12647-2 (2012)**  
**Proposal: only five ISO curves (A to E)**  
**A "16%", B "19%", C "22%", D "25%", E "28%"**



**Curves A to E:**

according to the results of 160+ test print series in sheetfed and web offset with coated papers, uncoated papers, SC, LWC ...

**Curve E (28%) applies to non-periodic screening (FM)**

# Offset 2009 (ISO 12647-2)

## Standard printing conditions Offset 2007-2008-2009 bvdM/ECI/Fogra Projects – CharData – ICC Profiles

No.	Profile (ECI)	PT	Screen	TVI %**	TAC %	Kmax	GCR	CharData
1	ISO Coated v2 300	1/2	AM	13 16	300	95	K9/10	FOGRA39
2	ISO Coated v2	1/2	AM	13 16	330	95	K9/10	FOGRA39
3	PSO LWC Improved *	3	AM	16 19	300	98	K10/10	FOGRA45
3 a	PSO LWC Standard *	3	AM	16 19	300	98	K10/10	FOGRA46
4	PSO Uncoated ISO12647 *	4	AM	19 22	300	98	50	FOGRA47
5	SC paper	SC	AM	16 19	270	100	K9/5	FOGRA40
6	PSO MFC paper	MFC	AM	16 19	280	98	50	FOGRA41
7	PSO SNP paper	SNP	AM	19 22	260	98	K9/10	FOGRA42
8	PSO Coated NP 300 ISO..	1/2	NP/FM	28 28	300	98	50	FOGRA43
9	PSO Coated NP 330 ISO..	1/2	NP/FM	28 28	330	98	50	FOGRA43
10	PSO uncoated NP ISO..	4	NP/FM	28 28	300	98	50	FOGRA44

\* = new profiles 2009

NP = non-periodic screening (FM) | SC = super calendered, MFC = machine finished coated, SNP = standard newsprint paper (heatset) | \*\* TVI% for CMY, TVI% for K (non-periodic screening: KCMY same values)  
TAC = total area coverage/ tone value sum

# Example: StoraEnso "Press Selection 2009"



**Recommendations:  
ICC Profiles (ECI)  
to be used with  
papers**

**CIELAB  
coordinates  
D50/2**

**... appreciated by printers, print buyers**



**1 ISO TC 130 WG3  
Graphic Technology**

**ISO 12647 ff**

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