



Working together toward greater efficiency

Is Quality Control In The Printing Industry Build On Quicksand?

Eddy Hagen

VIGC - 15/10/2009

Introduction

- **Flemish Innovationcenter for Graphic Communication**

- **Not for profit organisation, based in Turnhout (Belgium)**
- **Services:**
 - Education
 - Trendwatching
 - Consulting
 - Networking

Contents

- **Introduction**
- Customers want...
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

What do customers want?



What do customers want?

- **Customers want quality!**
 - VIGC Survey (2007): second reason why they change print supplier (first reason: cost...)
- **But how do you define quality?**
 - **Looking good?**
 - Rather subjective...
 - **Looking similar to reference?**
 - Previous job?
 - Pantone book?
 - Other references?
 - **Measured (color) values are within specified tolerances?**

Contents

- Introduction
- **Customers want...**
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

What do customers want? Quality!

• Measuring color

- **Densitometer:** measures density, not color!
- **Spectrophotometer!**
- **Color deviations: delta E**
 - Distance between two colors in a 3D-space
 - But a 'warped' 3D-space...
- **But which delta E?**
 - Delta E*ab, CIE 94, CMC, CIEDE2000
 - Due to 'warped' 3D-space: same number of delta E*ab does not always have same perceived difference (visual)

Contents

- Introduction
- **Customers want...**
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

What do customers want? Quality!

• Which tolerances?

- **E.g. ISO 12647-2 (solid process colors)**
 - Deviation tolerance (proof vs ok print):
delta E*ab = 5
 - Variation tolerance (ok print vs rest of run):
delta E*ab = 4 (KCM) or 5 (Y)
- **Customer defined tolerances...**

Contents

- Introduction
- **Customers want...**
- Findings
- Conclusions



Is Quality Control In The Printing Industry Build On Quicksand?

What do customers want? Quality!

- **So: quality control depends heavily on use of spectrophotometers**
- **But how good are they?**
 - **Deviations between measurements with the same device**
 - 'Cold' vs 'warm' device...
 - **Deviations between instruments**
 - This means troubles!
 - Printer measures, print job is within tolerances
 - Customer measures with his device, print job is out of tolerances
 - And job gets rejected...
 - Who is to blame???

Contents

- Introduction
- **Customers want...**
- Findings
- Conclusions

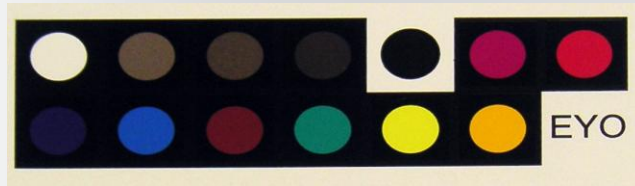
Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

VIGC study on spectrophotometers

• What did we do?

- Measurements with > 20 devices, used in production (not right out of the box!)
 - 6 types, multiple brands
- Reference: Netprofiler test chart + certificate with correct values (CIELAB)



Contents

- Introduction
- Customers want...
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What did we find?

- Some findings are not really encouraging...
- Published in September 2008
- Lots of reactions, from all over the world

Contents

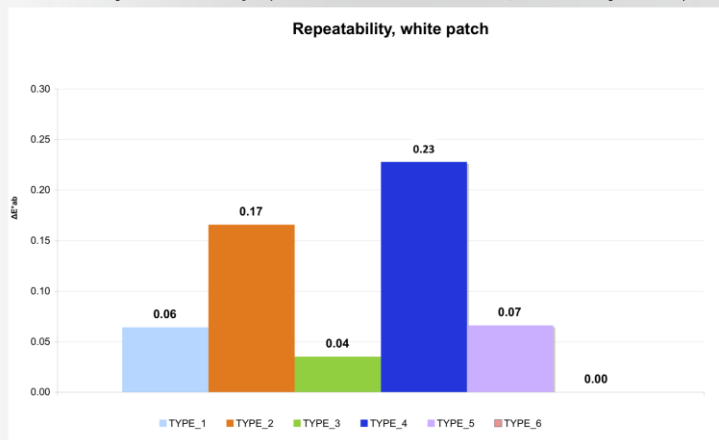
- Introduction
- Customers want...
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What did we find?

• Repeatability (12 measurements, white patch)



Is Quality Control In The Printing Industry Build On Quicksand?

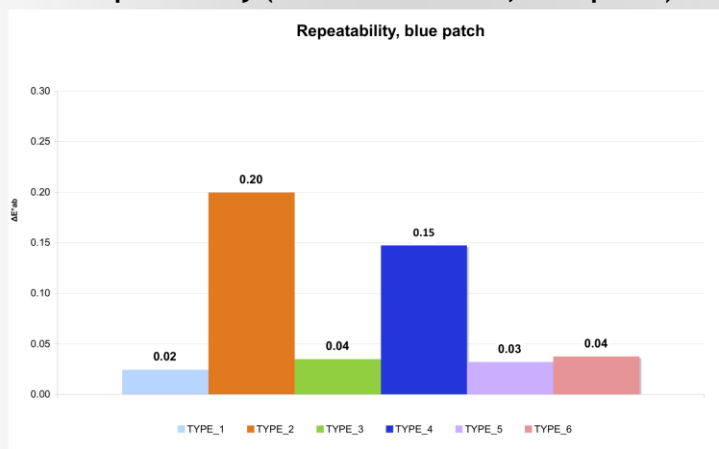
Contents

- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

• Repeatability (12 measurements, blue patch)



Is Quality Control In The Printing Industry Build On Quicksand?

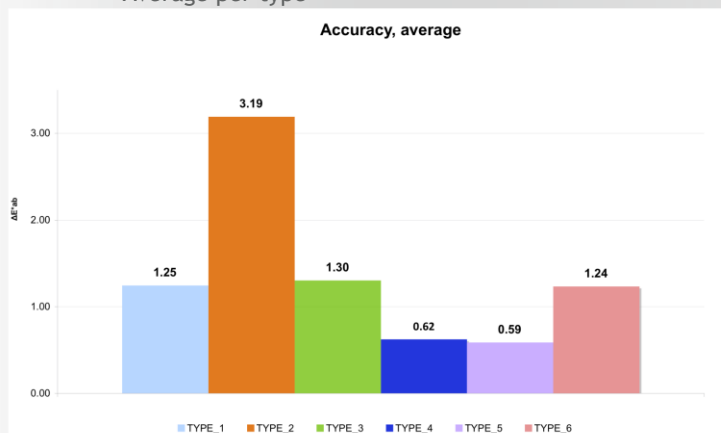
Contents

- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

- Accuracy (measured results vs certificate)
 - Average per type



Is Quality Control In The Printing Industry Build On Quicksand?

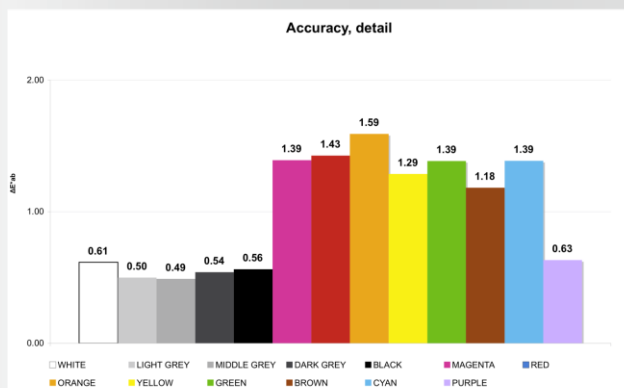
Contents

- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

- Accuracy (measured results vs certificate)
 - Average of all instruments, per color



Is Quality Control In The Printing Industry Build On Quicksand?

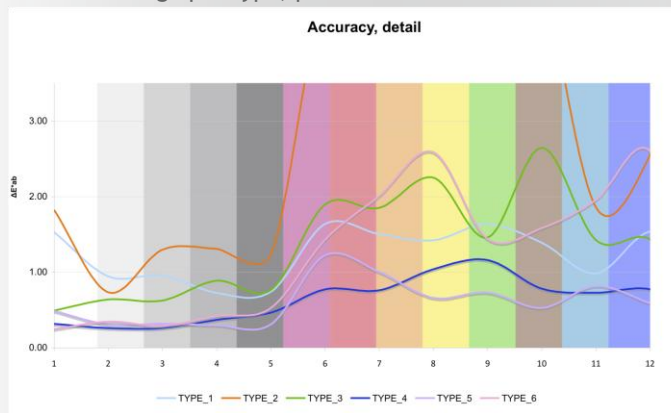
Contents

- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

- **Accuracy (measured results vs certificate)**
 - Average per type, per color

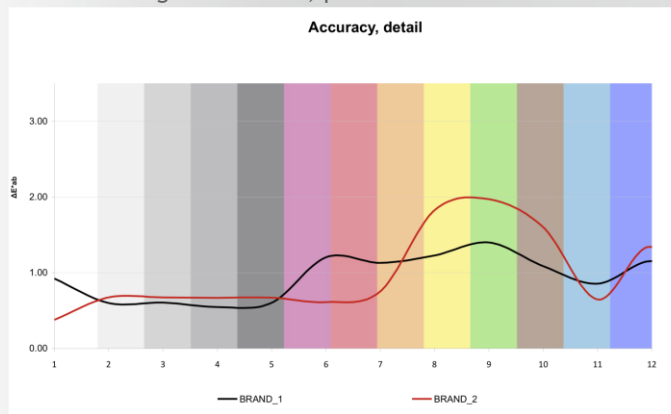


Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What did we find?

- **Accuracy (measured results vs certificate)**
 - Average two brands, per color



Is Quality Control In The Printing Industry Build On Quicksand?

Contents

- Introduction
- Customers want...
- **Findings**
- Conclusions

Contents

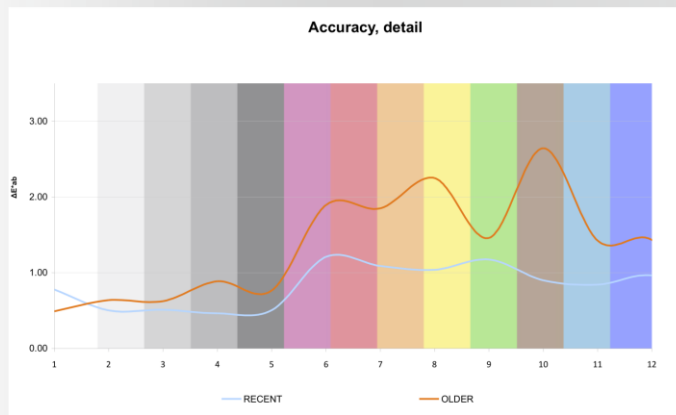
- Introduction
- Customers want...
- **Findings**
- Conclusions

VIGC study on spectrophotometers

• What did we find?

• Accuracy (measured results vs certificate)

- Old instrument vs more recent one



Is Quality Control In The Printing Industry Build On Quicksand?

Contents

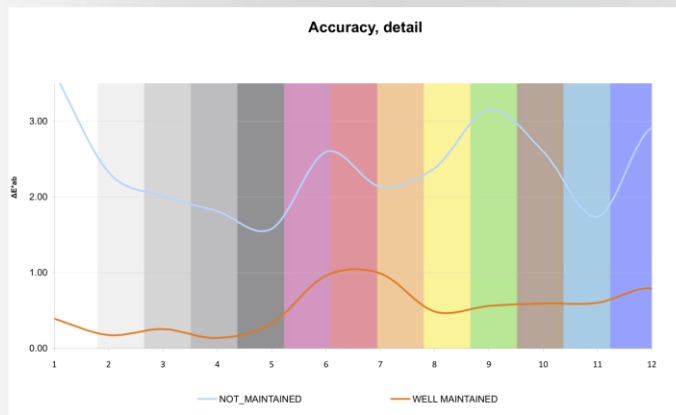
- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

• Accuracy (measured results vs certificate)

- Maintenance: not vs well maintained



Is Quality Control In The Printing Industry Build On Quicksand?

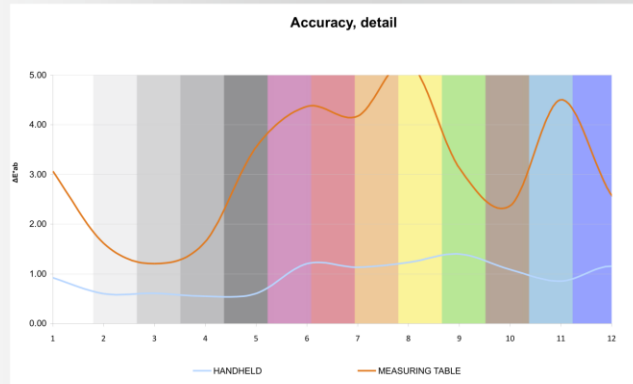
Contents

- Introduction
- Customers want...
- Findings
- Conclusions

VIGC study on spectrophotometers

• What did we find?

- **Accuracy (measured results vs certificate)**
 - Handheld vs measurement table printing press...



Is Quality Control In The Printing Industry Build On Quicksand?

Contents

- Introduction
- Customers want...
- **Findings**
- Conclusions

VIGC study on spectrophotometers

• What did we find?

- Differences between instruments can be higher than tolerances customers demand!
- Certainly differences between different brands in specific colors
- Don't mix measurements!
- Calibrate on a regular basis!
- Maintenance is absolute necessity!
 - E.g. dust...
 - E.g. dirty calibration tile...
- More recent types have lower deviations

Contents

- Introduction
- Customers want...
- **Findings**
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What might have caused deviations?

- Next to maintenance, ...

Contents

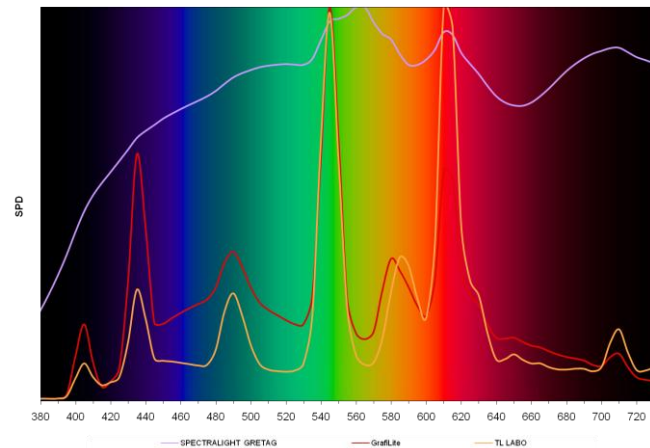
- Introduction
- Customers want...
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What might have caused deviations?

- Light source: light bulb, LED, ...

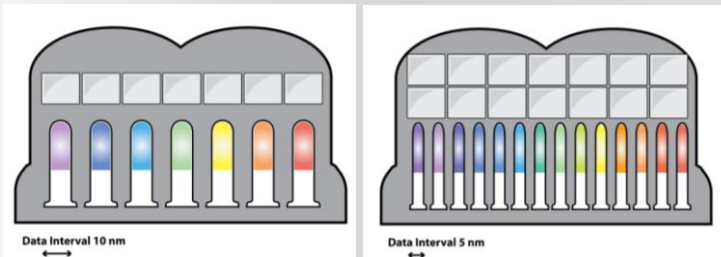


VIGC study on spectrophotometers

• What might have caused deviations?

• Scanning interval

- ISO 13655:1996 specifies
 - Min. 20 nm
 - Best 10 nm



Contents

- Introduction
- Customers want...
- Findings
- Conclusions

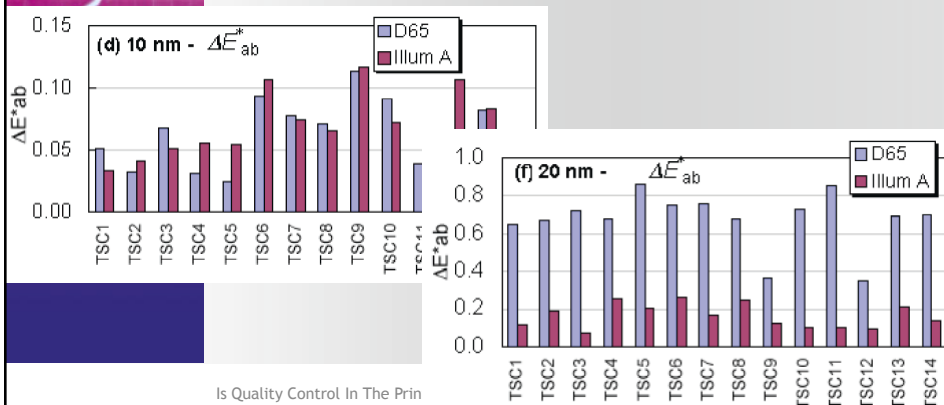
Is Quality Control In The Printing Industry Build On Quicksand?

VIGC study on spectrophotometers

• What might have caused deviations?

• Scanning interval

- Difference 10 nm vs 20 nm (research by Yoshi Ohno)



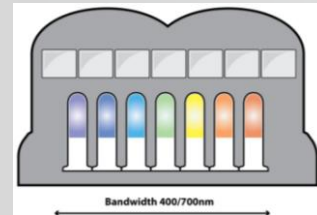
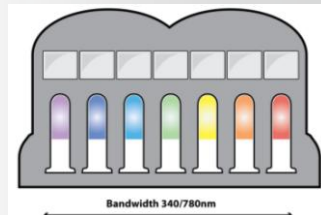
Is Quality Control In The Prin

VIGC study on spectrophotometers

• What might have caused deviations?

• Bandwidth

- ISO 13655:1996 specifies
 - Min. 400-700 nm
 - Best 340-780 nm



Contents

- Introduction
- Customers want...
- Findings
- Conclusions

Is Quality Control In The Printing Industry Build On Quicksand?

Conclusions

Conclusions

- **Customers demand quality**
- **Spectrophotometers are key for quality control**
- **But deviations occur...**
 - Between individual devices
 - Between types
 - Between brands
- **Maintenance is important!**

Contents

- Introduction
- Customers want...
- Findings
- **Conclusions**

Is Quality Control In The Printing Industry Build On Quicksand?

Thanks :-)



Working together toward greater efficiency

 **Vlaams
Innovatienetwerk**
met steun van IWT

Strategic partners VIGC

AGFA 

ESKO 
artwork

HIFLEX
MIS & Web2Print
Business Automation Systems

Kodak

océ

 **Plantin**
business partner of
HEIDELBERG