OVERCOMING CHALLENGES SURROUNDING COLOR MANAGEMENT IN CERAMIC DIGITAL PRINTING THROUGH NEW APPROACHES

DIGITAL PRINT WORKFLOW & COLOR MANAGEMENT SOLUTIONS FOR

COMMERCIAL PRINTING

INDUSTRIAL PRINTING

Large Format  Film & Repro  Proofing  Packaging  Textile  Décor  Ceramics

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ColorGATE at a glance

About ColorGATE

Headquarter
Hannover

40 Employees

600 Sales partners

90 OEMs

1,600 Printer devices

Development branch office
(Hanau)

Foreign offices
UK, Italy, Singapore and Foshan (China)

12,000 Customers (licences)

21 years Experience

since 1997
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Challenges in the digital decoration of ceramic materials

The color-consistent decoration of ceramic products is a big challenge due to varying natural materials and the complicated production, which for example provides a firing process between 800° and 1400° C.

Challenges

- Often changing and non-standardized raw materials (e.g. frits, feldspar, clay, quartz, kaolin, silica, chemicals etc.)
- Complex and demanding production process whose parameters partly have a considerable influence on color development (e.g. compounding, pressing, engobing, glazing, drying, firing)
- Different compositions and formats require different kiln profiles
- Non standadized ink sets, configurations, effekt inks and colors

“With the ColorGATE solution it is much easier to produce fast, color-consistent prints specifically for the ceramics industry.”
Barbara Golster, Deutsche Steinzeug
Unsuitable and suitable measurement technology

Rapid Spectro Cube (RSC)

All-in-one Color Management solution for ultrafast color measuring and ICC profiling for industrial digital printing applications.
“What you see is what you get” - “Measure like your own eyes”

Typical spectrophotometers for graphical applications are specialized to read the single patches of printed media in a standard compliant way according to their fixed illumination and sensor geometry. They apply low-resolution sensors which make the process very time-consuming and it may lead to incorrect measurements of structured or translucent or reflective surfaces, with the consequence that obtained measurement data is useless for accurate color management.

The RSC, however, with its high-resolution sensor technology is able to read a large surface at once and provides accurate measurement results, even for surfaces that are difficult to measure to characterize them precisely. In doing so, the reading method of the RSC corresponds to the actual color impression of the human eye.
Measurements and profiles can be acquired from different conditioned substrates, such as.

From non-white/tinted or colored substrates, such as:
- Corrugated
- Leather
- Wood, ceramics
- Metallic surfaces

From translucent substrates, such as:
- Backlit materials
- Glass
- High gloss ceramic tiles
- High gloss finished décor panels
- Metallic surfaces

From structured substrates, such as:
- Carpets
- Ceramic tiles
- Leather
- Textiles
Fingerprint Module (FPRM)

Patented technology for a “digital color twin”
ICC Profile versus Fingerprint Profile

Standard ICC Profile

= = =

design

color description of design

Fingerprint Profile
Fingerprint Module (FPRM): How does it work?

The production file will be saved including the embedded color characterization.

This fingerprint production file, which includes a colorimetric specification of the initial print, represents a digital master that provides a reliable reference so that future reprints can be reproduced exactly and color consistent.
1. Initial Production & Fingerprint Creation

- TIFF
- PSD

Productionserver (PS) processes Fingerprint Measurements

2. Reproduction with Fingerprint Production File

- PS generates the Fingerprint Production File

- TIFF
- PSD

Fingerprint Production File
- Designspecific
- Colorimetric fingerprint
- Universal reproducible

Productionserver (PS) processes Fingerprint Measurements

Result Production

Result Reproduction

MATCH

RAPID SPECTRO CUBE

Fingerprint Measurements
Workflowanimation/Cooperation with Durst