

Flexo Seminar
Russia, 2018

(European) Trends in Flexography and Packaging Printing

What we can learn from the Packaging Printing market
and the entries to the 2017 FlexoTech Award

by

Prof. Dr. Martin Dreher
DFTA Technology Centre, Stuttgart, D

Intro

- Martin Dreher, Prof. Dr. /VAK Moscow
- DFTA Technology Centre
Scientific Director

and

Stuttgart Media University HdM
Professor for Package Printing
Packaging Engineering

- martin.dreher@dfta.de
dreher@hdm-stuttgart.de



The DFTA Technology Centre briefly introduced



DFTA
FLEXODRUCK AKADEMIE

DFTA TECHNOLOGIEZENTRUM
Die FlexoKompetenz.

1. General Outlook and
 2. Observations based on Award Entries
- ... make the two sections in this

AGENDA

DFTA
FLEXODRUCK AKADEMIE

DFTA TECHNOLOGIEZENTRUM
Die FlexoKompetenz.

Legend

- The size of the pylon  is meant to mark

my personal assumption about how

big / important / relevant / severe / ...

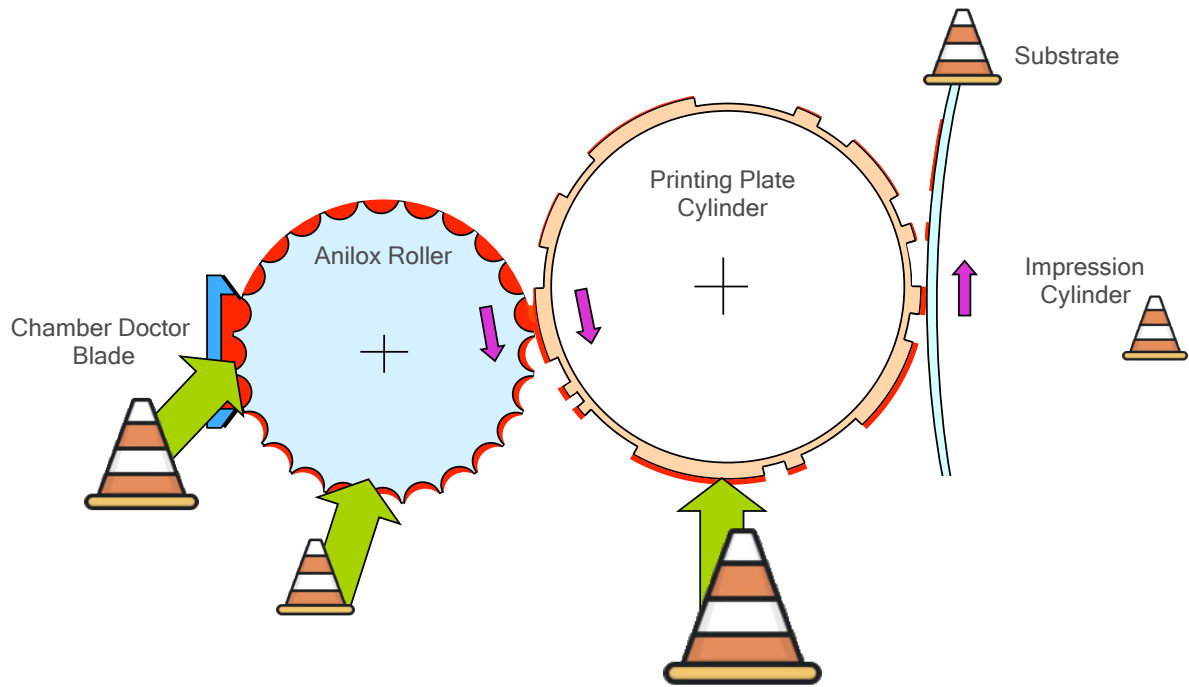
the respective trend may be for Flexography or Packaging Printing at large

Part 1

The following Count-Down of Novelties and Trends may not be complete, but it has been composed from the neutral standpoint of my occupation with the DFTA Technology Centre and covers my observations about the overall market as a

GENERAL OUTLOOK

Modern Flexo Print Deck



Printing Presses



Central Impression Cylinder Press (foils, papers)



- „New“ Manufacturer: Allstein
 - Improved Press concept
 - Vibrations



Source: www.allstein.com

Corrugated Postprint



Digital production press: Bobst



Source: http://media.bobst.com/dede/mitteilungen/detail/article/1432710177-bobst-nimmt-die-erste-beta-installation-seiner-revolutionaeren-digitaldruckloesung-in-betrieb/#.VXAH1mD_xQA

Substrates



Plastic Films

- Matte surface or
- Partially printed matte varnish leaves glossy spots open

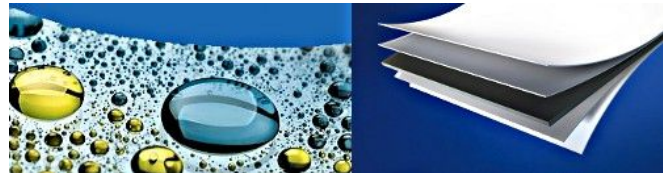


Source: www.plasticstanduppouch.com



Fibre Materials

- Improved surface coating
- (**Flexo printed?**) barrier functions approaching



Source: <http://www.smurfitkappa.com/vHome/de/HoyaPapier/Seiten/Spezifische-Produkte-aus-Hoya.aspx>

- New recycling rules/legislation

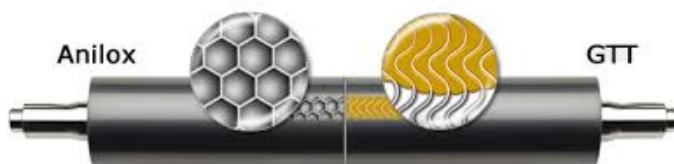


Anilox Rollers



Initiator APEX with GTT

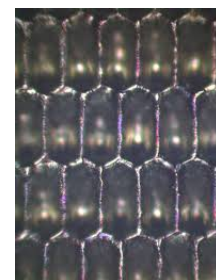
- Mixed results, partially very good



Source: www.aniloxroll.ru

Other Manufacturers

- Alternative engraving structures (other than hexagonal)
 - Elongated cells improve on filling and ink transfer



Source: www.paperandprint.com

Printing Inks

Water based



- For fibre materials
 - Gradual improvements
 - No ground-breaking innovations



- For plastic films
 - Substantial improvements!
 - Differences with solvent based inks still noticeable
 - Gloss level
 - Printability
 - Handling



Source: www.follmann.com

Other ink systems

- Solvent based
 - Product improvement
 - Simplification (lesser numbers of ink series)
 - Characteristics
 - Very high standard



- Radiation curing
 - UV
 - Gradual improvement
 - No ground-breaking innovations



- EB
 - Competition leverages efforts



Print Formes from Photopolymer

Round-Top-Dot



- Pros and Cons
 - „simple“ system
 - Better print results in highlight tonal range
 - No surface structuring

• Innovations



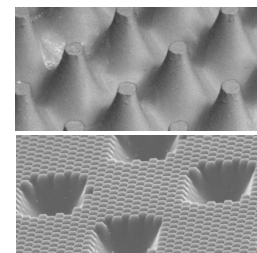
- DuPont Cyrel* Performance Plates
 - Built-in **surface structure improves on ink transfer**
- DuPont Cyrel* Easy System
 - Built-in barrier yields Flat-Top-Dots
- Flint FTF
 - Built-in barrier yields Flat-Top-Dots

Flat-Top-Dot



- Pros and Cons
 - Robust and better control
 - Less wash-boarding in Postprint
 - Substantially more **ink transfer** through surface structure

• Absolute Must! Strong Trend



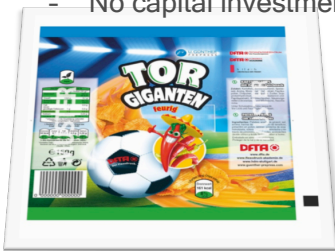
Sources: MacDermid and Kodak

Novelties from the DFTA Technology Centre



DFTA Screen V4.2, V5.x and V6 "Penta"

- AM screen
 - 63 L/cm
 - Advanced growth strategy
 - Clever angling strategy
- Quality without "arms race"
 - „only“ 2540 dpi > high productivity
 - No capital investments required



DFTA Planoflex 2

- Full contact through halftone dots over all
 - Enabled through DFTA Screen 4.2
 - Counters vibrations, enables higher press speeds
 - Simplified make-ready
 - Today: suitable for paper applications



General Trends



High definition halftone screens

- AM screening
 - 70 to 80 L/cm
 - Better image details
- Prerequisite for printing with fixed colour palette?
 - High AM screen ruling
 - FM screen with <20x20 micron dot sizes



Fixed Colour Palette Printing

- 4 to 7 fixed primaries
 - Replaces (CMYK + n specials)
 - Up to 90+% of Pantone colours (7C)
 - No ink washing, no residual inks
 - Optimized make-ready
- Optimum registration required
- All image elements become screened composites!

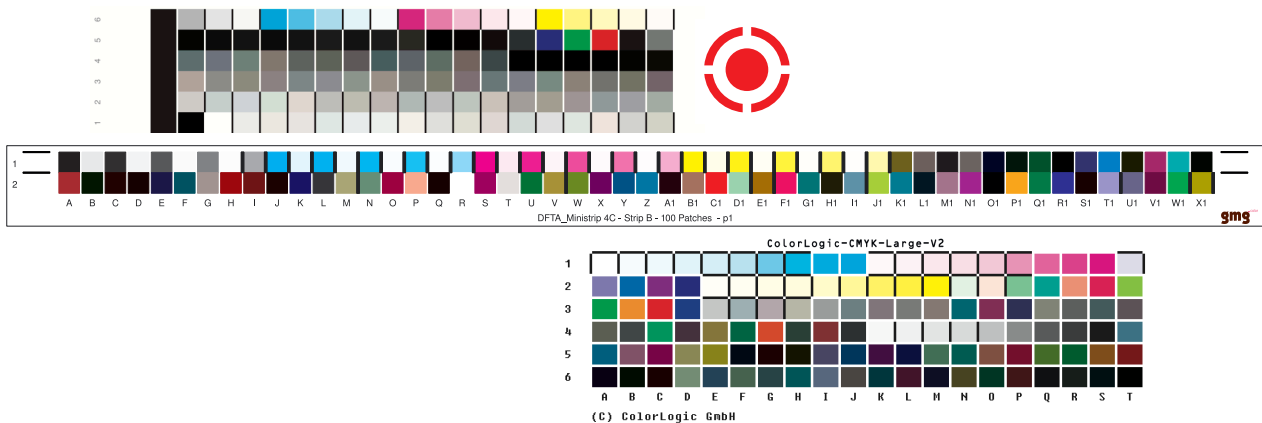


Source: notonthehighstreet.com

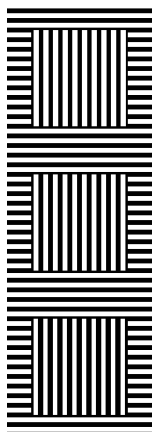
Colour Profiles



- Plausibly generated through [Mini Test Targets](#) (e.g. DFTA All-in-One, GMG or ColorLogic)
- Computation, correction and maintenance of colour profiles through ColorLogic or GMG Software



True Rolling in the Flexo Print Deck

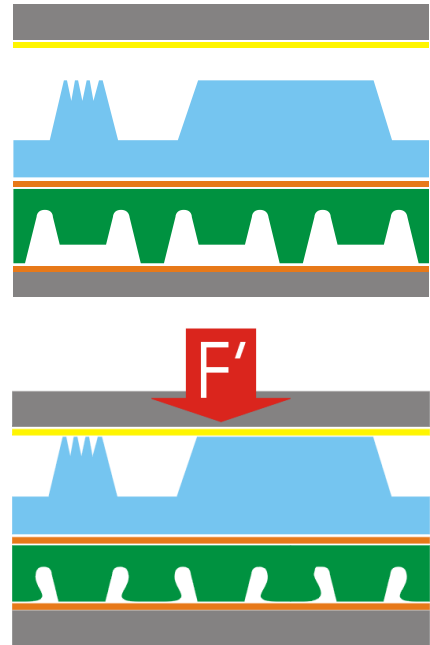


- Faults may have severe consequences and reasons are hardly known in the industry
- Very important learnings and observations about this aspect during the past 2 years
- New signal element to indicate optimum status

Substructures for Printing Plates



- Improved suspension characteristics
- Simplifies combination printing: Solid and delicate halftone together
- Smoother running of the press
- Higher press speeds possible
- Diminished / no vibration marks
- Is being analysed intensively by the DFTA Technology Centre
- Based on patented **DFTA Planoflex** technology



„DFTA-Planoflex“



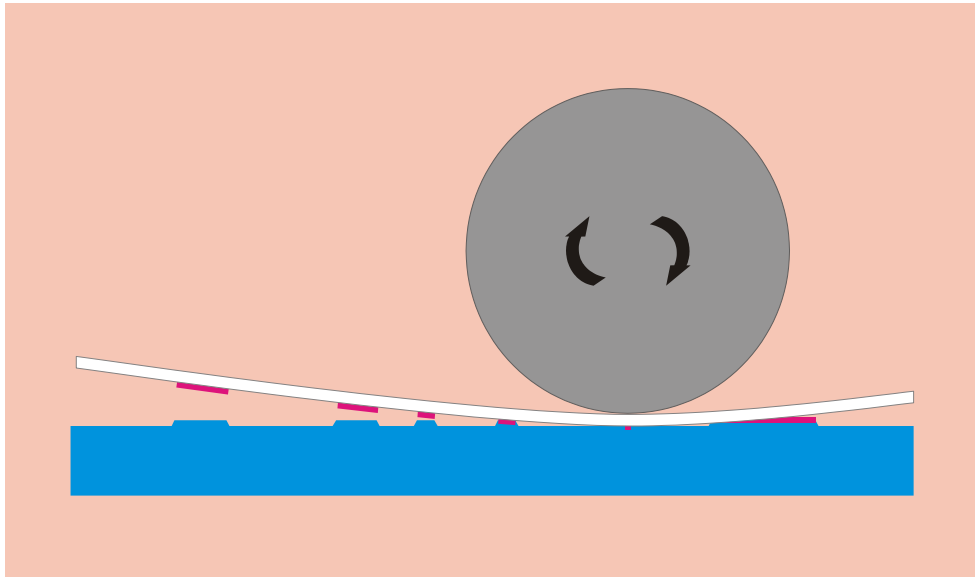
- New Flexo application with radical change of letterpress principle:



- VERY flat relief: approx. 150µm instead of >500µm, may be achieved very accurately through simple (patented) process
- Differentiation of printing vs. non-printing areas occurs in the inking stage in Letterpress manor
- Impression engagement of Anilox-to-Printing Plate is enforced on Kissprint level >>> long term consistency of the press run, no ink build-up
- Impression of Printing Plate-to-Substrate deliberately high to achieve full contact >>> vibrations minimized / avoided

- Patent granted!


„DFTA-Planoflex“ in Principle



Colour Measurement Technology



- Inline colour measurement has been improved
- Large packaging buyer asks for it! (only?)
 - Delta-E must be measured reliably on ALL prints (in picture)
 - At press speeds of 600 m/min

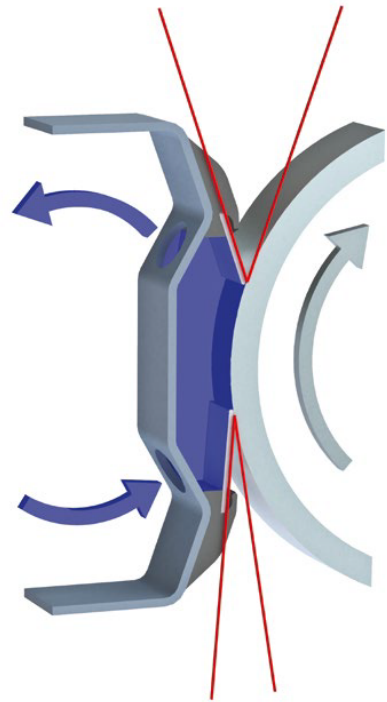
 Comparison / benchmark of measuring geometries for “difficult” substrates underway at DFTA Technology Centre



Doctor Blade Chambers



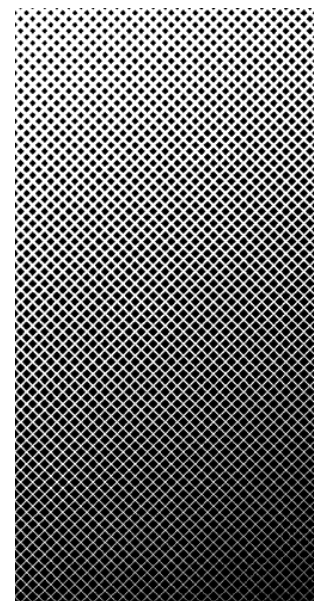
- New Doctor Blade Chambers work very well at the DFTA Technology Centre
 - Installed January 2018
 - 2x AKEBOOSE
 - Concealing: very good
 - Wear: looks good, but needs to be observed further



Halftone Screens and Screen Rulings



- Average does not really raise, most Flexographers still work successful in the 40 L/cm / 100 lpi range
- Top values now at > 80 L/cm / 200 lpi
- FM / Stochastic screen is back! But seen critically at places



Source: http://www.typografie.de/Unsere-Buecher/Grafikdesign/Clemens-Hartmann_Arne-Schneider/Rasterblock::672.html >>>

Comeback of 0,76 mm Printing Plates?



- Do the ultra-thin printing plates come back broadly?



Maybe in new combinations with the DFTA Substructure?



DFTA Planoflex:

Shallow relief does not need much Photopolymer, so why have it? (Cost, Weight, Handling, Environment, Storage etc.)

Roadmap of Package Printing (1) „2023“



- Concentration on Conventional Printing Method
- Digital Printing complementing
 - Smaller & smallest Order Sizes (Fragmentation)
 - Minimum Order Quantities
 - Pre-Press Cost
 - Lead Times
 - Obstacles persist!
 - **Packaging Requirements!**
 - Very few presses ww
- Will Online-Sales simplify Package Printing Graphics???
 - Lesser number of colours?
 - Fixed Colour Palette? (7C rather than 4C+++)?

Roadmap of Package Printing (2)

„2030+“



- Concentration on Digital Printing Method
- Flexography complementing
 - Many remaining large order quantities
 - MUCH better Per-Item-Cost
 - Colour separation like Digital Printing! CMYKRGB?
- Integration in Packaging Lines?

Part 2

And here are the interesting insights into the international packaging printing scene and potential trends observed through the

2017 FLEXOTECH AWARD

Sources: FlexoTech Award & Market Observations

- Author was jury president in 2017 (and will perhaps continue in 2018)
- Entries showed potentially interesting trends
- Partly to be compared with entries from 2017 DFTA AWARD and enriched with other sources from own observations



Stochastic (FM) Screens everywhere!

- May vignette out to substrate white with no edges
- More forgiving against slight mis-register
- Better definition in photographic pictures
- No saw-tooth effect on screened linework elements
- Potential supporter of Fixed Colour Palette Printing
- Has been demonstrated to work at DFTA Technology Center for ProFlex 2017:



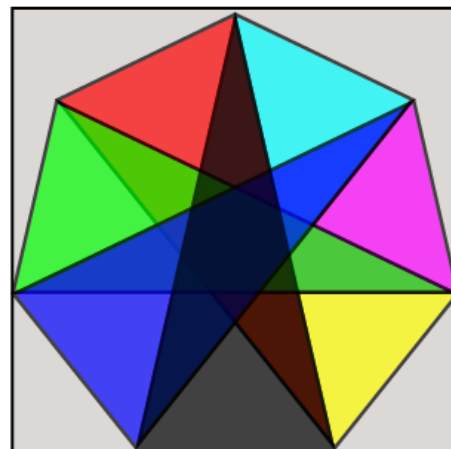
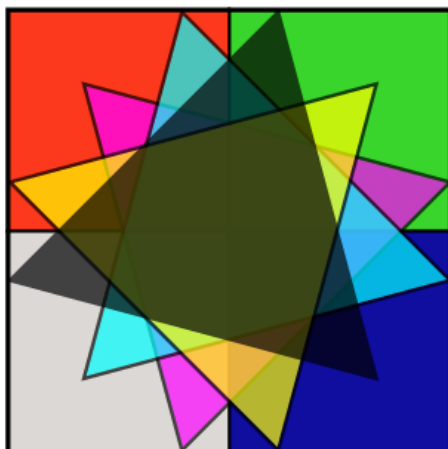
Stochastic Screening, FM Screens

- Improved photographic image quality @ lesser demand!
- Limited to Flexo & Offset
- Perfectly aligned with Digital Printing



Fixed Colour Palette Printing advancing?

- 4C++++ vs. 7C+



Fixed Colour Palette Printing advancing?

- Potential means to industrialize Flexography
- Digital printing operates this way and gets away with it!
- Many entries with CMYK only!

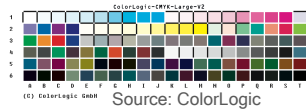
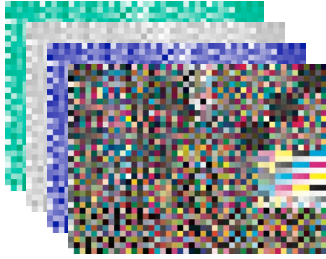
- Also known as ECG (Extended Colour Gamut), BUT please mind the subtle nuances:

FCPP or ECG: Which Type are you?

- „Simulator of (ex) Special Colours“ or „Enhancer of Photographs“?



Multi Channel Colour Management for FCPP



- 7C Colour Management = (4C Colour Management)³?
Does NOT work!

- Clever simplifications required
- Spectral profiling is very helpful and advanced

Corrugated PrePrint: Harmony

- Similar quality levels between Germany and FlexoTech entries
- But: non-Germans seem to be more open for “experiments” like with Stochastic (FM) Screens



Corrugated Postprint: Very Remarkable!



- Excellent quality!
- External markets on a par with Germany, if not slightly advanced in print quality

Better than Offset-Lithography!

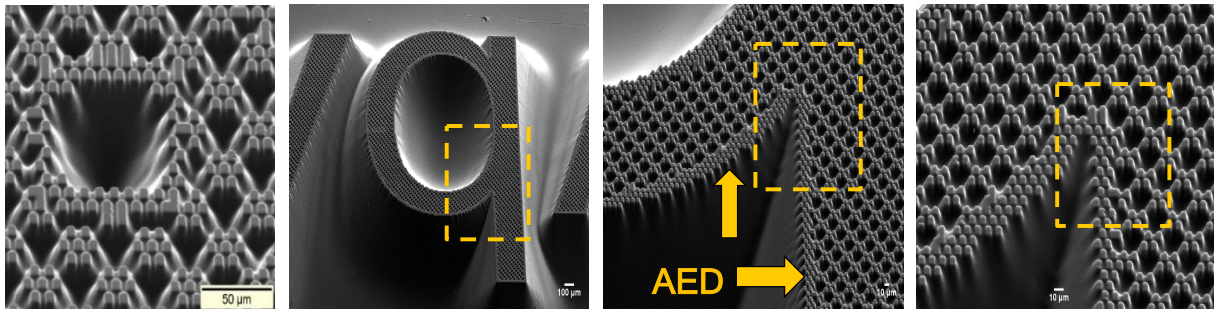
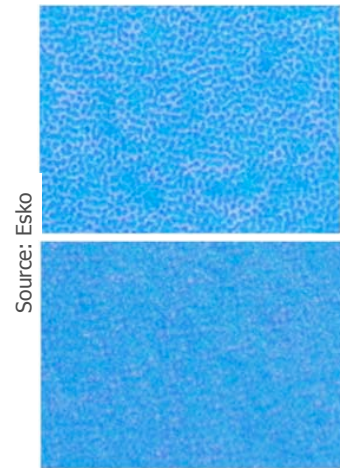
Folding Carton printing with Flexo?



- Stagnating
- Very high quality level!
- Apparently good business for a few specialized companies

Enhanced Ink Transfer

- Standard! MUST have!
- No Award Winning without it
- Digitally introduced vs. intrinsically included
- Bottom photos: courtesy of Kodak, include edge definition



Security Printing Features for the Mass Markets

- Anti product counterfeiting
- Advances into mass markets
- Delicate details may be introduced in halftone screen



Flexo better than Digital, Offset or Rotogravure?

- Reproduction of ex-Offset, -Digital or -Rotogravure jobs through Flexography
- Flexo sometimes (much) better in quality



1. General Outlook and
 2. Observations based on Award Entries
- ... make the two sections in this

SUMMARY



(European) Trends in Flexography and Packaging Printing

Thank you for your Attention!

by
Prof. Dr. Martin Dreher
DFTA Technology Centre, Stuttgart, D