

# RIP SOLUTIONS FOR FUNCTIONAL & DECORATIVE APPLICATIONS

ICC EXPERT'S DAY 2019

# SUMMARY



- STORY
- MARKETS
- APPLICATIONS
- CHALLENGES
- SOLUTIONS

# STORY

FUNCTIONAL AND  
DECORATIVE

# ALL COMES FROM INKS

- CMYK
- LIGHT INKS
- SPOT INKS: ORANGE / BLUE / GREEN
- UNCOLORED INKS: WHITE / VARNISH / METALLICS
- DIMENSING
- BEHAVIOR CHANGE: TEMPERATURE / UV / PH / WATER
- GLOWING AND PHOSPHORESCENT
- CONDUCTIVE AND ELECTROLUMINESCENCE

# DIMENSING



# AUDI TT HACK



# PACKAGING APPLICATION



# MARKETS

FUNCTIONAL AND  
DECORATIVE



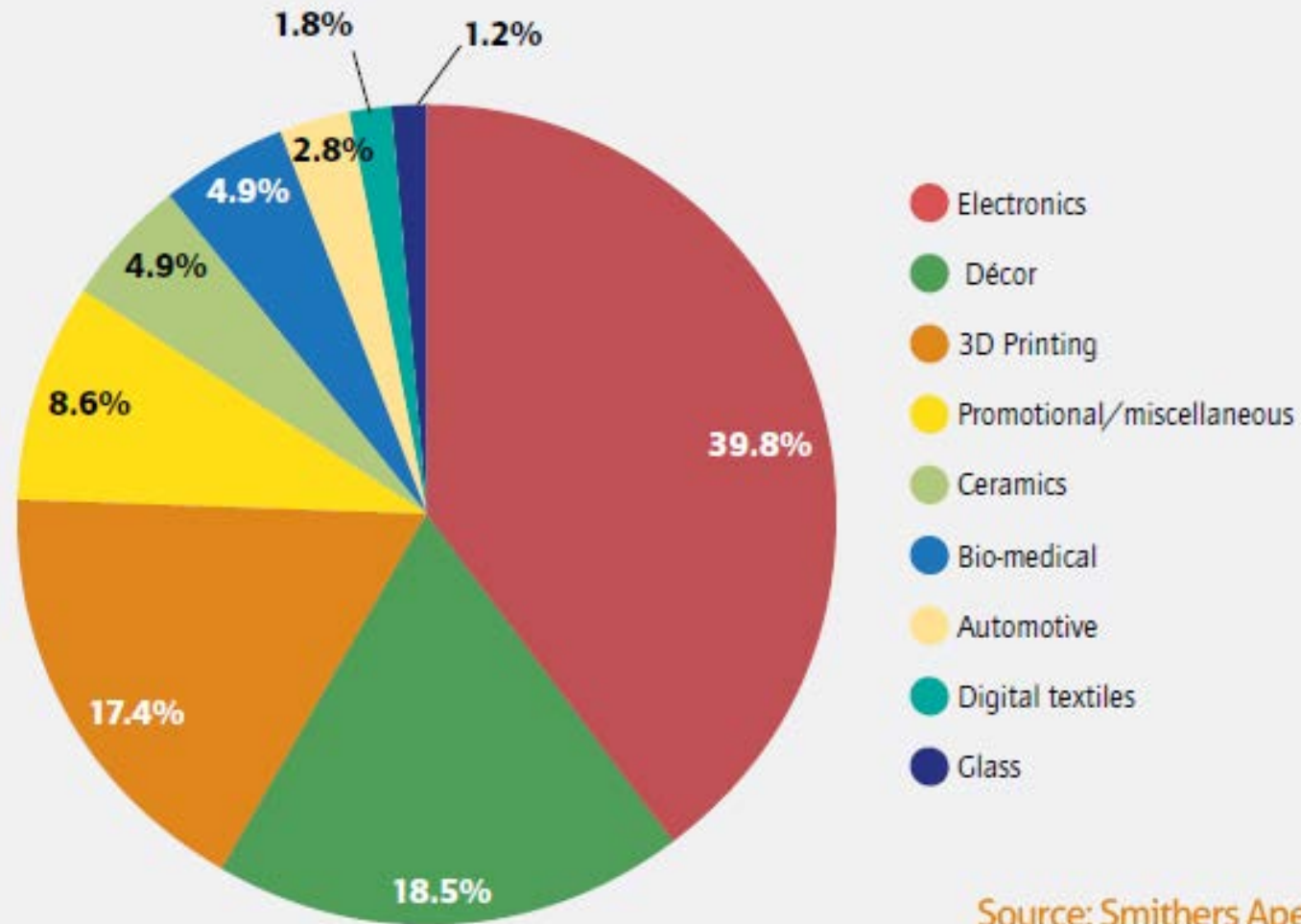
# FUNCTIONAL AND DECORATIVE MARKET



\$107.9-\$123 BILLION BY 2020  
\$13.6 BILLION BY 2023 FOR PRINTED  
ELECTRONICS



AVERAGE CAGR OF 8.3% TO 2022  
UNTIL 15% FOR PRINTED ELECTRONICS

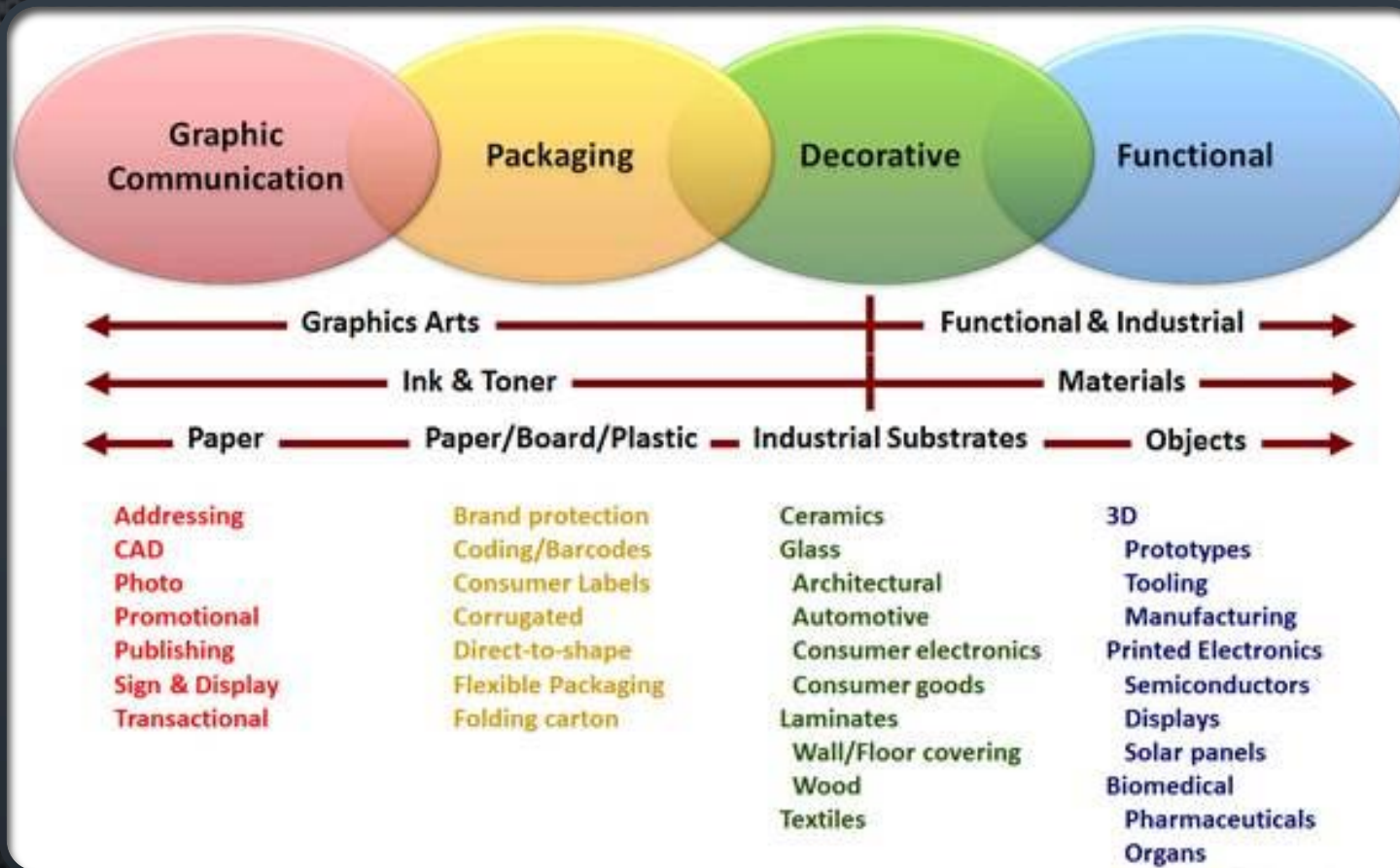


Source: Smithers Apex

# GLOBAL FUNCTIONAL INDUSTRIAL PRINT MARKET BY APPLICATION, 2020 (\$ BILLION, CONSTANT VALUES)

# APPLICATIONS

FUNCTIONAL AND  
DECORATIVE

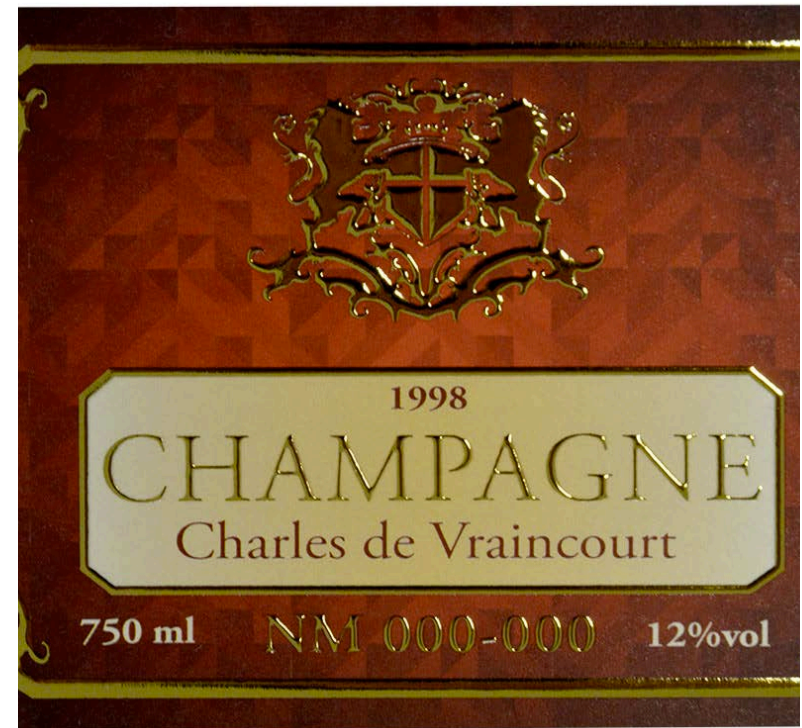
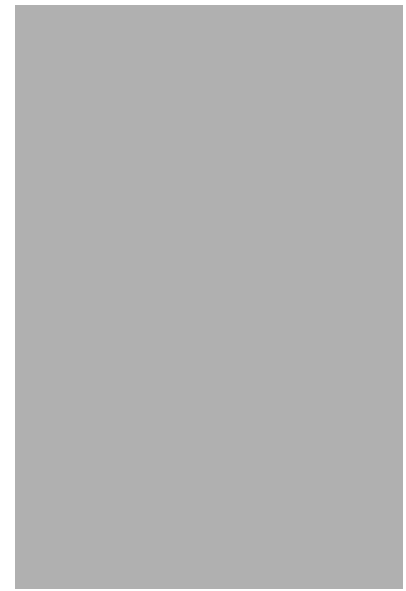


# APPLICATIONS

## INFOTRENDS - FIPS

# PACKAGING / LABELS

- VARNISH
- GOLD



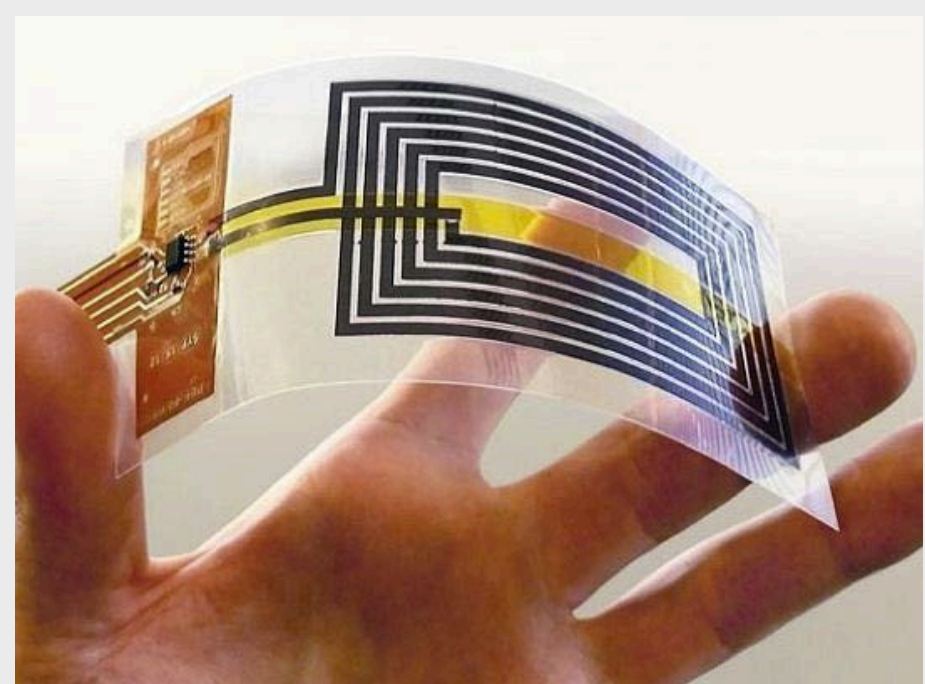
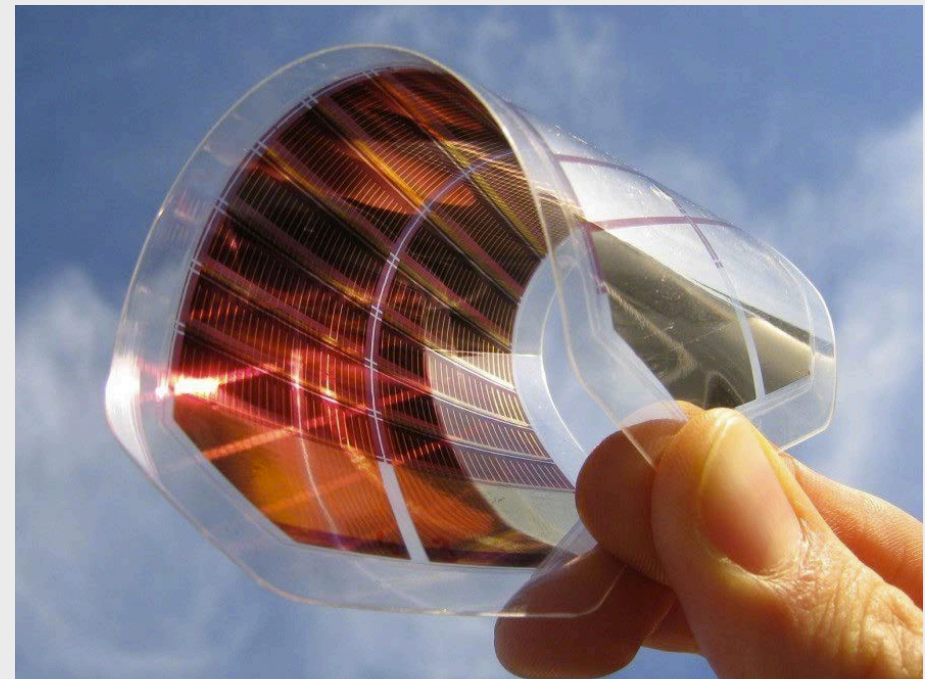
# DECORATION

- WALLCOVERINGS
- CANVASES
- WALL DECALS
- WINDOW COVERING
- CERAMICS
- TEXTILES
- LAMINATES



# FUNCTIONAL

- ENERGY HARVESTING
- WIRING
- ENERGY EMITTING
- SENSORS

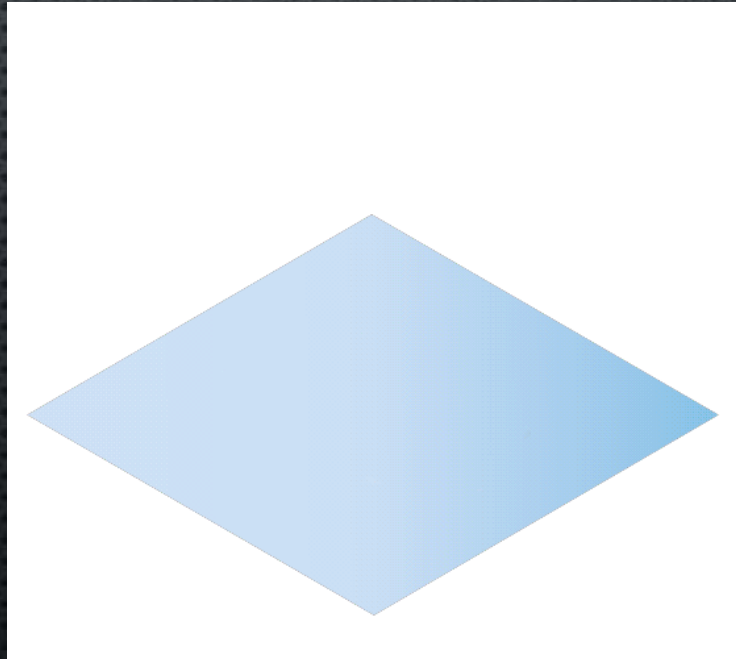


# CHALLENGES

FUNCTIONAL AND  
DECORATIVE



# MULTI-LAYER



DAY



NIGHT



# PRINT THE SAME EVERYWHERE

- FOGRA RESEARCH
  - COMMON APPEARANCE
  - SIDE-BY-SIDE



**Question 1:** why do images in set B have a similar appearance whereas the images in set A do not?

**Question 2:** Is the degree of similarity of a set of images something that could be measured?



# RIP SOLUTIONS

FUNCTIONAL AND  
DECORATIVE

Spectral – Accuracy

Assumptions about Illuminant – Observer

Media Color – Chromatic Adapation

RGB → LAB → CMYK – Flexibility

CMYK → CMYK – Purity and Gradients

## COLOR LAYERS

ICC Max – Accuracy

ICC v2-v4 PCS - D50/2°

ICC Colorimetric Intent – Chromatic Adapatation

ICC Device – Flexibility

ICC DeviceLink – Purity and Gradients

## ICC LAYERS



## SPOT INKS VS. PROCESS INKS

Only  
Linearisation,  
not profiling

Calibration  
and Profiling

Prepare  
each Job

No  
preparation  
of Jobs

You can not  
measure

You can  
measure



# EFFECTS OF MULTI-LAYER ON COLORS

Multi-  
Profiles

Multi-  
Jobs



# PRINT THE SAME EVERYWHERE EVERY TIME



UNICORN



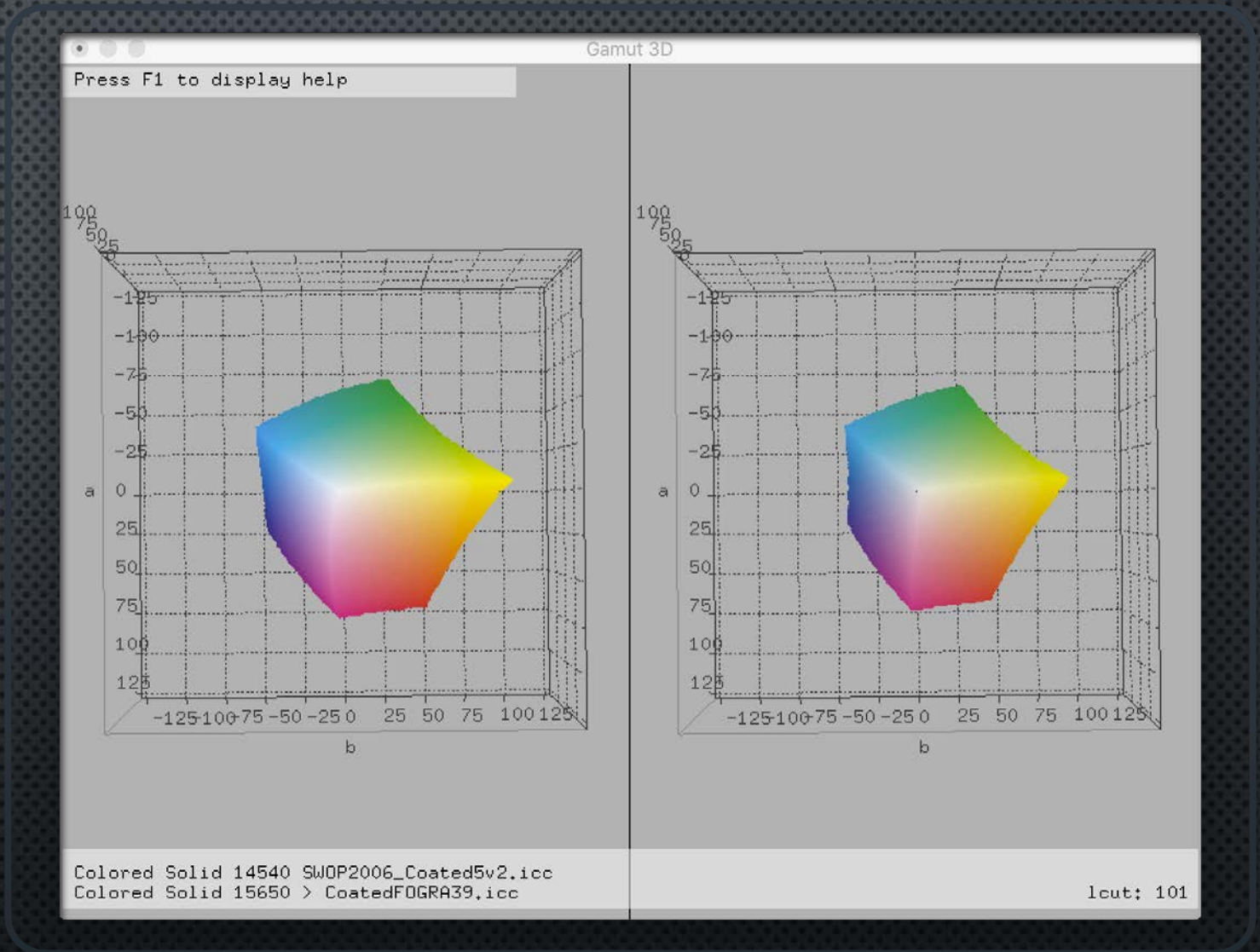
COLOR  
SERVER



CLOSED  
LOOP



MACHINERY  
STABILITY



01

Linearization

=

Minimum property  
Activation

02

Ink Limit

=

Mixing Property  
Activation

03

Profiling

=

Behavior  
Prediction

04

Measuring Colors

=

Measuring  
Properties

## COLORS / PROPERTIES ANALOGY

QUESTIONS ?

# SOURCES

- [HTTPS://WWW.SMITHERSAPEX.COM/NEWS/2016/OCTOBER/FUNCTIONAL-INDUSTRIAL-PRINT-MARKET-FORECAST](https://www.smithersapex.com/news/2016/october/functional-industrial-print-market-forecast)
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