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***Flint***Group



# UV Days

*Prague*  
*March 2026*

# Presenters



**Wojciech Szindler:**  
*Commercial Director NW CEE*



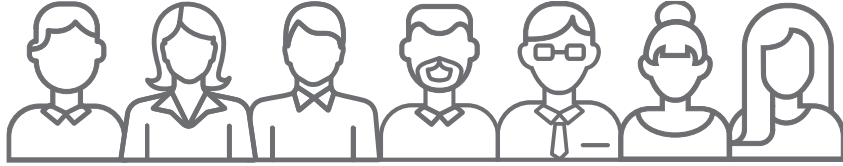
**Pierre Dogliani:**  
*Technical Director NW Europe*

# Today's Agenda

- Flint Group Overview
- Technology Overview
- UV LED vs Mercury curing
- Operational Excellence
- Regulatory - Past, Current & Upcoming Changes

# Flint Group Overview

# Key Facts



We employ approximately  
**5,000 diverse & talented people**  
worldwide

We have staff collaborating  
across **76 sites**  
and in **32 countries**



We listen to our customers & focus on **reducing complexity, providing superb service & reliability,**  
and **sustainability & regulatory support.**

Revenue in 2024 was

**€1,5 billion**



# Flint Group has global reach via an extensive network of cost competitive facilities

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**MARKET SEGMENT COLOR KEY**

- ◆ CPW
- ◆ Paper & Board
- ◆ Flexible Packaging
- ◆ Offset Packaging Solutions
- ◆ Narrow Web
- ◆ Xeikon (Digital Solutions)

**FACILITY TYPE SHAPE KEY**

- Mother plant
- ◆ Satellite facility
- Global Colour Centre
- ★ Global Discovery Centre
- ▲ Blanket Converting
- ▶ Other / Storefront
- ◆ Chips / Resins

- United States**
- Beaufort, SC
  - Pine Bluff, AR
  - ◆ Atlanta, GA
  - ◆ Lebanon, OH
  - ◆ Ontario, CA
  - ◆ Portland, OR
  - ◆ Romeoville, IL
  - ◆ Charlotte, NC
  - ◆ Shreveport, LA
  - ◆ Rogers, MN
  - ◆ West Chester, OH
  - ◆ Asheville, NC
  - ◆ Batavia, IL
  - ◆ Elgin, IL
  - ◆ Elizabethtown, KY

- Canada**
- ◆ Montreal, Canada

- Latin America**
- ◆ Mexico City, Mexico
  - ◆ Lerma, Mexico
  - ◆ Bogota, Colombia
  - ◆ Lima, Peru
  - ◆ Santiago, Chile
  - ◆ Sao Paulo, Brazil

- South Africa**
- ◆ Johannesburg, SA
  - ◆ Cape Town, SA
  - ◆ Durban, SA
  - ◆ East London, SA

- India & Middle East**
- ◆ Dubai, UAE
  - ◆ Hosur, India
  - ◆ Noida, India
  - ◆ Lamdapura, India
  - ◆ Mumbai, India
  - ◆ Kolkata, India
  - ◆ Hyderabad, India
  - ◆ Vadodara, India

- Australia**
- ◆ Melbourne

- New Zealand**
- ◆ Auckland

- Europe**
- ◆ Ruabon, UK
  - ◆ Irlam, UK
  - ◆ Wolverhampton, UK
  - ◆ Dublin, IR
  - ◆ Deventer, NL
  - ◆ Winschoten, NL
  - ◆ 's-Gravenzande, NL
  - ◆ Helmond, NL
  - ◆ Malmö, SE
  - ◆ Trelleborg, SE
  - ◆ Barcelona, ES
  - ◆ Clermont, FR
  - ◆ Fretin, FR
  - ◆ Dijon, FR
  - ◆ Cognieres, FR
  - ◆ Burgdorf, CH
  - Konstantynów Łódzki, PL
  - ◆ Łódź, PL
  - ◆ Willstaett, DE
  - ◆ Winterbach, DE
  - ◆ Stuttgart, DE
  - ◆ Frankfurt, DE
  - ◆ Padua, IT
  - ◆ Caronno, IT
  - ◆ Cinisello, IT
  - ◆ Baranzate, IT
  - ◆ Istanbul, TR
  - ◆ Gornji Milanovac, RS
  - ◆ Lier, BE

- China, Japan & SE Asia**
- ◆ Guangzhou, CN
  - ◆ Shanghai, CN
  - ◆ Zhongshan, CN
  - ◆ Ho Chi Minh, VT
  - ◆ Bangkok, TH
  - ◆ Seoul, South Korea
  - ◆ Puchong, Malaysia
  - ◆ Shah Alam, Malaysia
  - ◆ Jakarta, Indonesia
  - ◆ Tokyo, Japan



# Providing colour for essential printed materials

Flint Group is your Global Partner with Local Presence and focused Key Account Organisation

## Market Segments

Paper & Board

Water-based Inks



Narrow Web Labels

Energy Cured Inks & Water-based Inks



Flexible Packaging

Solvent-based Inks



Offset Packaging

Press consumables & Sheetfed Packaging Inks



Heatset & News Inks

Stable Legacy Business



**XEIKON**

Digital Press Technology for Labels



Digital Press Technology for Corrugated



# Technology Overview

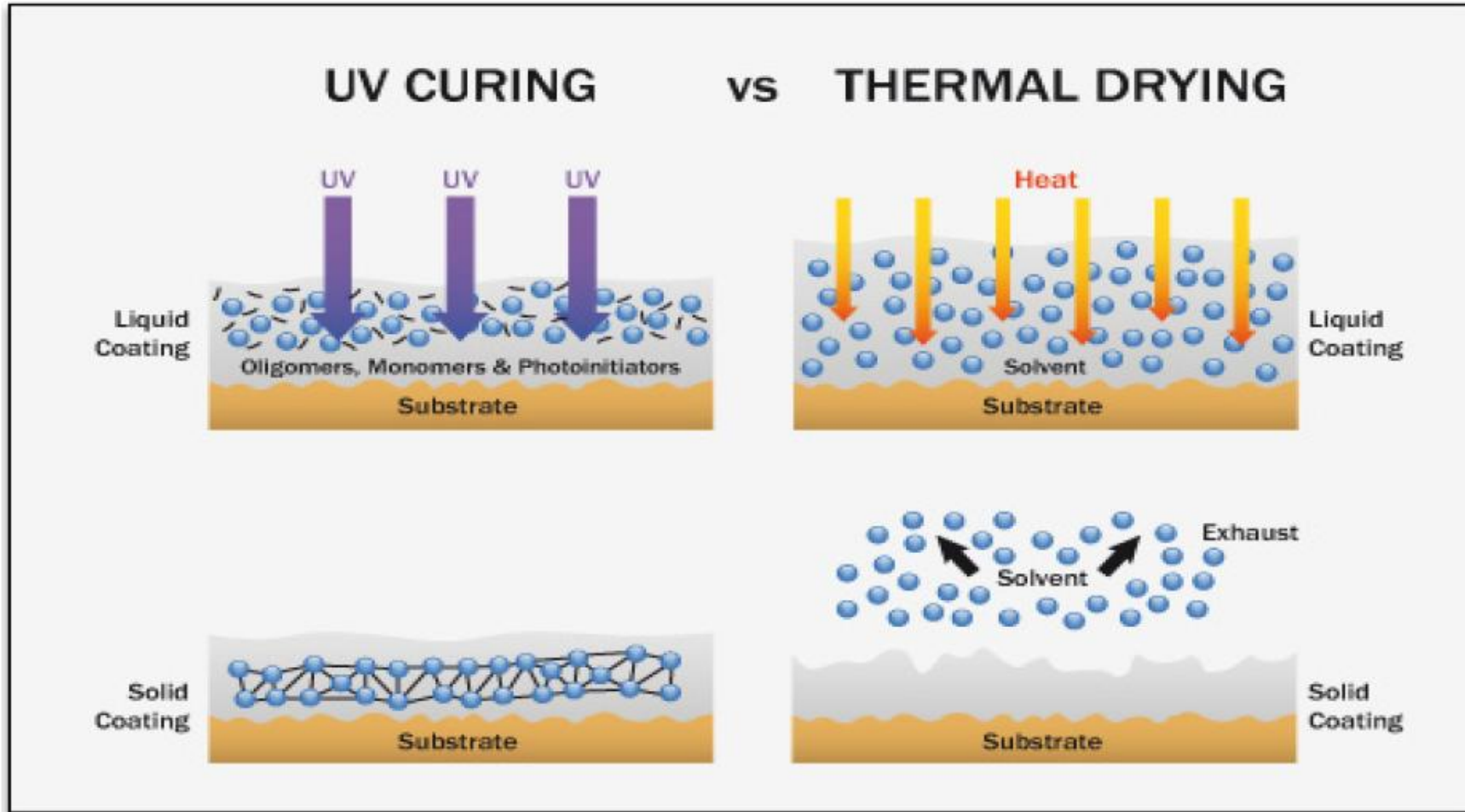


## What is ink?

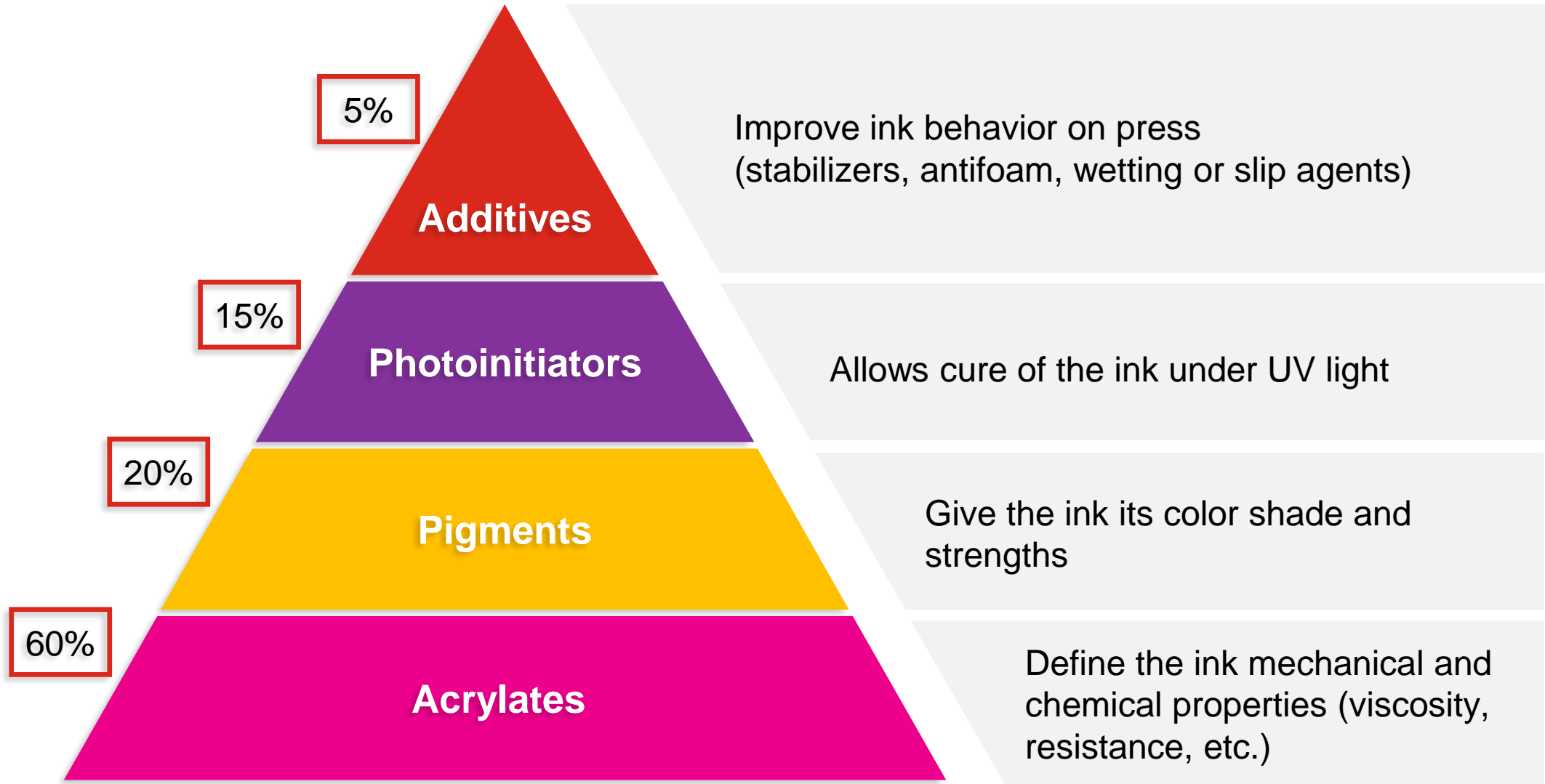
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- **Ink** is a liquid formulation that, after a drying or curing process, becomes a solid film on a substrate, covering surface. It is used to create images, text, or decorative effects.
- **Varnish or coating** is also a liquid formulation that, after drying or curing, forms a solid film. However, it is typically transparent and is used to protect, enhance, or modify the surface appearance rather than create an image.

# Drying Mechanism



# UV Inks Pyramid – Components of UV inks



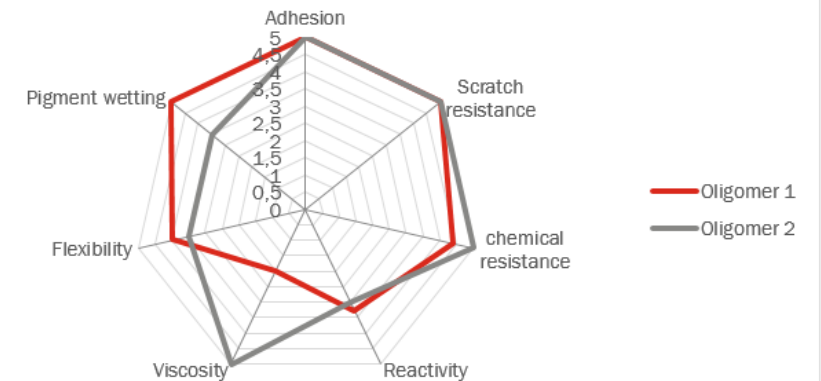
# 1. Acrylates - Creates the backbone of the UV ink system

Define the ink mechanical and chemical properties (viscosity, resistance, etc.)

- Wide range of different acrylates
  - Urethane acrylates
  - Polyester acrylates
  - Epoxy acrylates
  - Amino acrylates
- Wide range of properties
  - Pigment wetting
  - Chemical resistance
  - Scratch resistance
  - Reactivity

*Illustrative*

Differences Acrylates

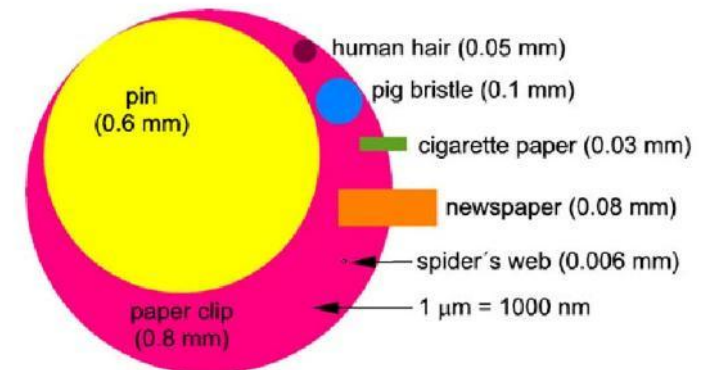
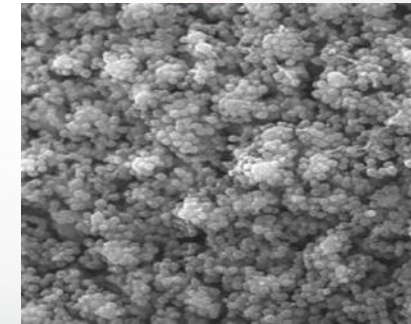


## 2. Pigments - Gives the color of the ink system

Give the ink its color shade and strengths

- Pigments in printing inks are fine solid particles
- Pigments comes from various origins such as Iron Oxides, copper, carbon, titanium
- Pigments are complex and each type will give different color and resistance properties
- Wide range of different pigments
  - All pigments have a specific pigment index, for example PY13, PY14
  - The pigment index number gives the chemical composition of the pigment but no information of the surface treatment
  - The most resource consuming part of new developments for ink manufacturers

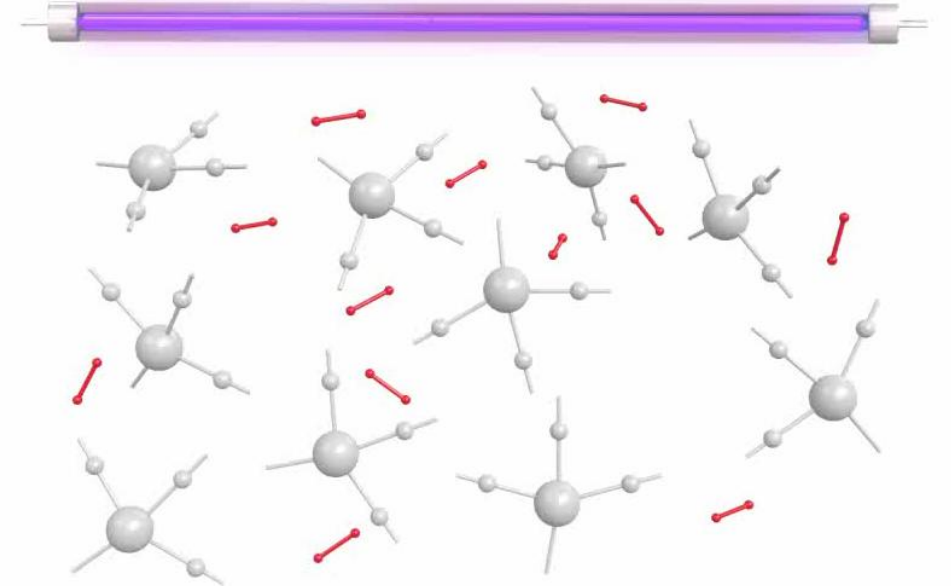
The average particle size for a standard liquid ink is less than 1 micron



### 3. Photoinitiators - Allows cure of the ink under UV light

Initiates the chemical reaction of the UV ink to go from liquid to solid

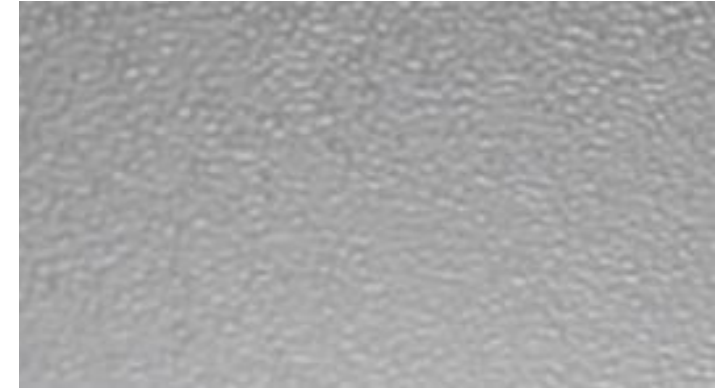
- Choice of photoinitiator defines your system
  - Dual curing (UV LED + UV Hg)
  - UV HG curing only
  - FCM (Food contact material)
  - Non FCM



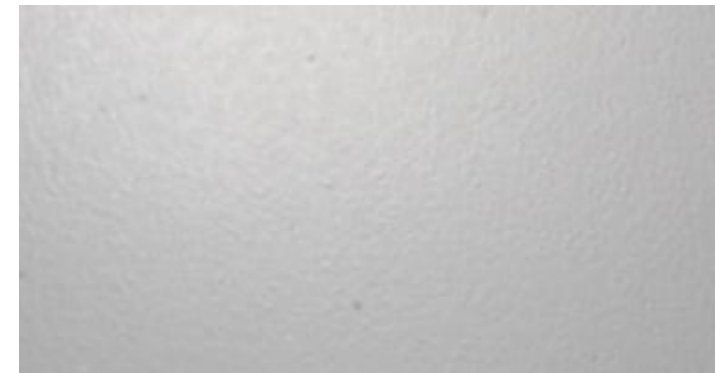
## 4. Additives - "Salt and Pepper" to give the final ink properties

**Improve ink behavior on press  
(stabilizers, antifoam, wetting or slip agents)**

- Small additions can give huge differences in performance
- Additives come in a wide variety of chemistries and final functions
  - Waxes (To increase rub resistance, Slip)
  - Defoamers (To reduce/prevent foam formation)
  - Silicone & Silicone acrylates
  - Adhesion promoters
  - Anti-statics
  - Matting agents
  - Dispersing agents



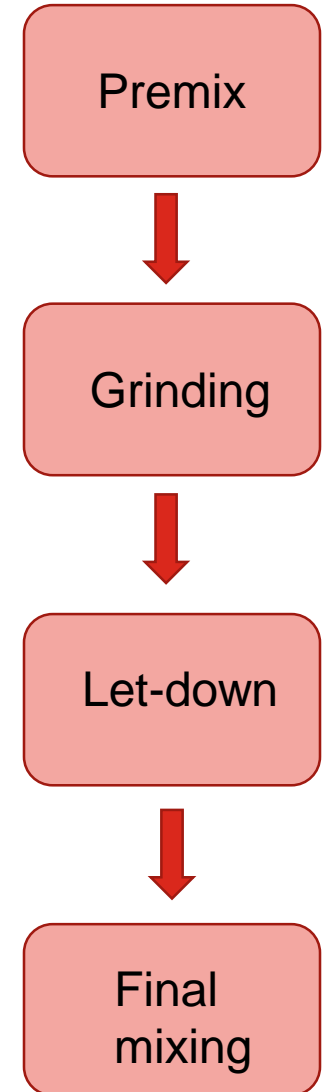
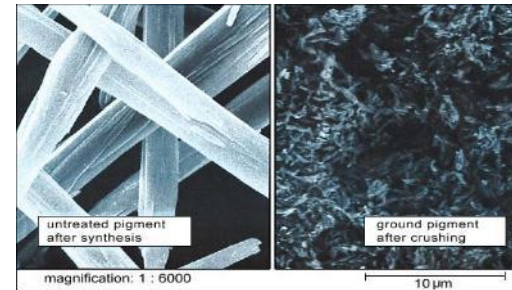
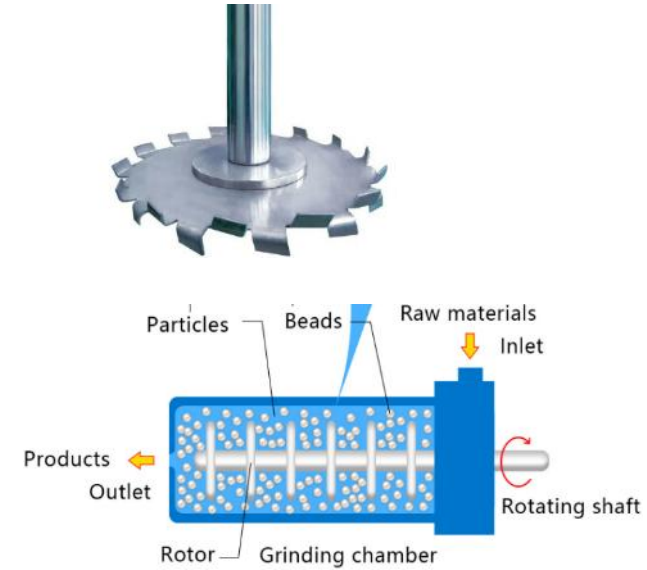
Without additive



With additive

# How is an UV ink produced?

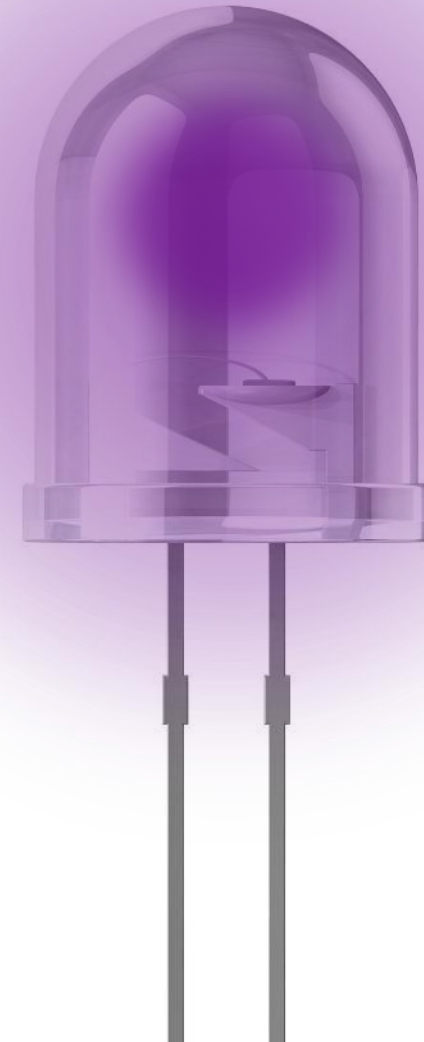
- **Premixing** is the addition of pigments, wetting acrylates & wetting additives
- **Grinding** is when the pigment particles are processed to their correct sizes
- Several types of machinery can do this
- **Let-down stage** is when the grinding process is complete and any other components need to be added
- **Final mixing** as a last step to make a homogenous ink



# LED vs Mercury curing

# What is UV LED?

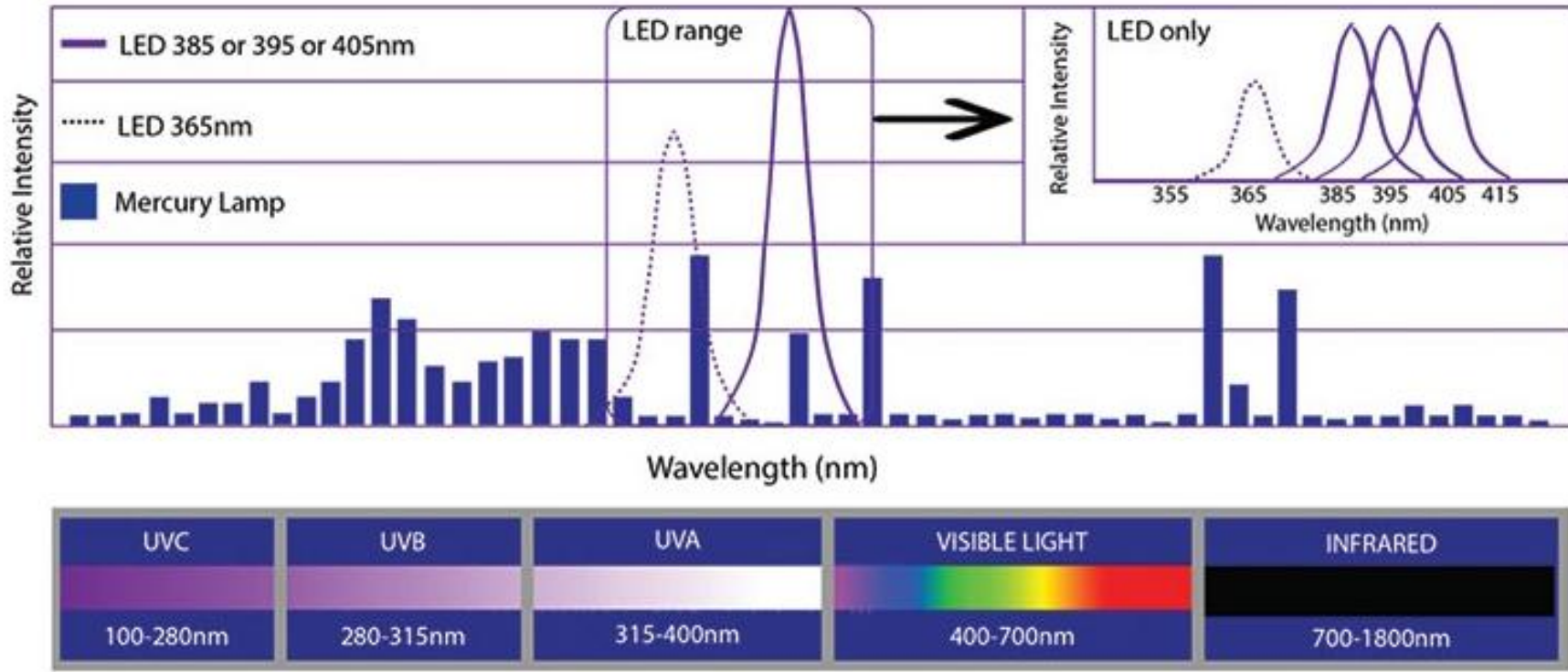
- UV LED means UltraViolet Light Emitting Diode
- UV LED is not a 'drop in' replacement for mercury bulbs, but presses can be retrofit to UV LED or new presses with UV LED cure can be purchased
- UV LED curing systems require new inks formulated specifically for this process
- Most conventional UV inks will NOT cure with UV LED lamps adequately



# Differences in the lighting systems

UV Hg lamps give away several different wavelengths, mainly between 200-400 nm (UV range)

UV LED lamps are operating at 365, 385, 395 & 405 nm commercially today. Main one in use is 395 nm.



How to transition your full operation without inventory hurdle?

# Mercury Arc vs LED Curing – Comparisons

	Mercury Arc	LED Curing
Lifetime	500 – 2,000 hours	> 20,000 hours
Environmental	Mercury waste / Ozone generating	Mercury-free / Ozone-free
Input Power	Large	Small (~half)
Maintenance	Bulb replacement & cleaning	Maintenance-free
On/Off	Minutes	Instant
Heat	~ 350°C	60°C

# EkoCure Dual Cure Ink Family cover a full range of products

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- EkoCure®  
The first commercially available ink designed for flexo and screen combination print (introduced in 2012)
- Currently 3 major flexo ink series (upgrade to Dual Cure since 2021)
  - EkoCure® F – our standard non FCM range for PSL labels.
  - EkoCure® ANCORA – Low migration high speed flexible packaging
  - EkoCure® ANCORA F2 – food contact material compliant / optimised for Label converts demands
- Full range of Pantone colours, Mixes as well as complete portfolio of Matt, High Gloss or TTR varnishes to support all type of applications



EkoCure®

# Operational Excellence

# 360° ServiceCode

# Our Service Philosophy is a 360° approach to add value

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**360°**  
**ServiceCode**



## **Identify Your Needs**

At the heart of our service philosophy is our ability to understand your needs and the pain points in your business



## **We understand your activity cycle**

We are colour and ink management experts. This knowledge enables us to understand your activity cycle when producing packaging.

We are in a unique position to have a 360° overview of the ink and colour management activity.

This overview enables us to benchmark your needs against industry best practices and provide recommendations for improvement.



## **Delivering the benefits**

Our skill lies in our ability to identify your improvement opportunities and, above all, deliver those benefits to you.

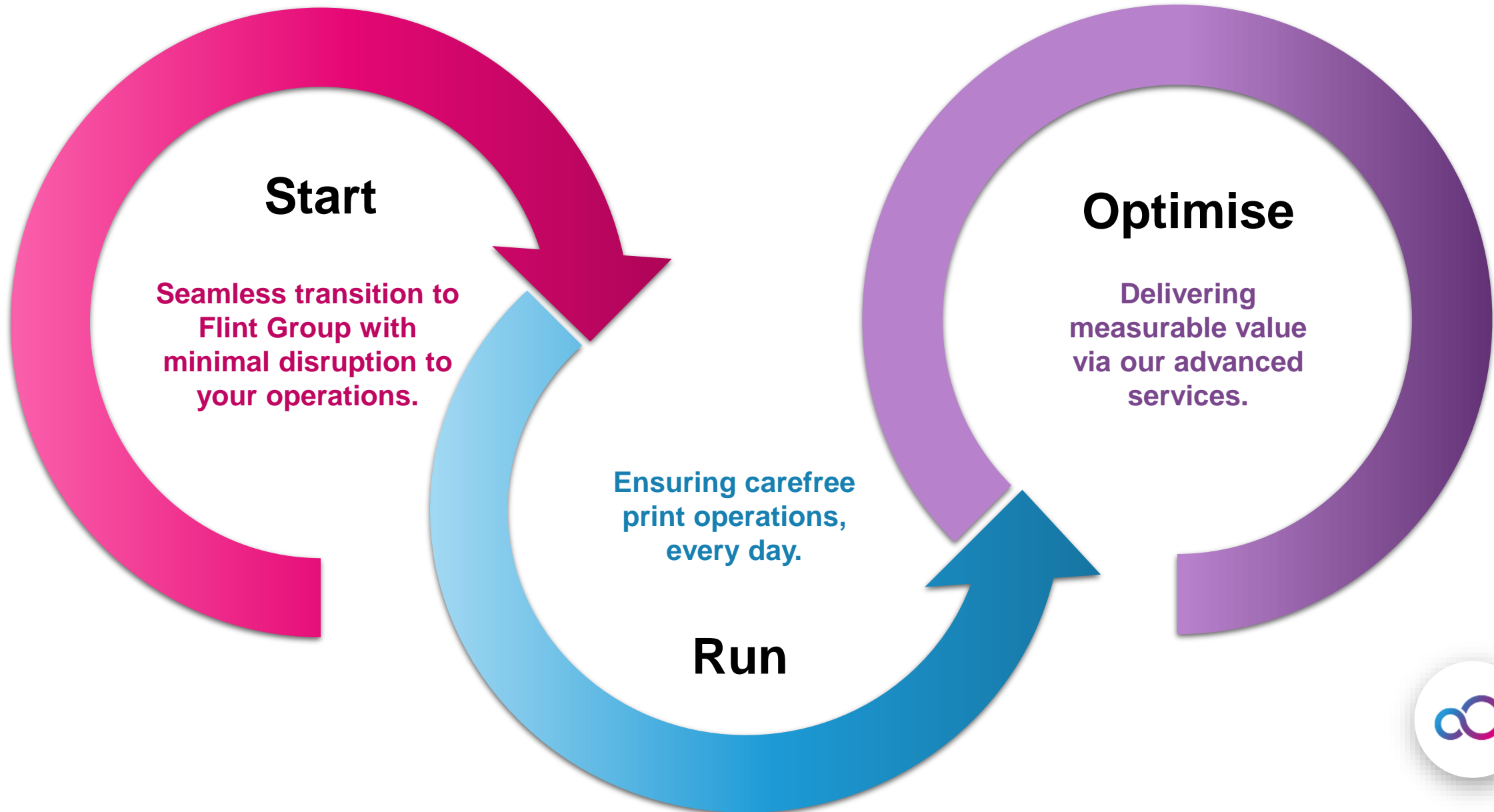


# How Flint Group works

*Implementation Methodology*



# Your service journey with Flint Group



# Technical Support | What does this mean?



Technical Support



Digital Solutions



Masterclass Training



Professional Services



Technical Support

- Transition Management
- Portfolio recommendation, simplification & standardisation
- Quality assurance
- Full scale testing capabilities
- Equipment installation & setup
- New product & application trials
- On-press support, brand owner print approval and troubleshooting



# Digital Solutions | What does this mean?



Technical Support



Digital Solutions



Masterclass Training



Professional Services



Digital  
Solutions

FlintLink provides access to:

- Webshop
- Ink safety & regulatory updates
- Product documentation (SDS & TDS)
- Project & benefit tracking – 360°Hub
- Troubleshooting Guide

VIVO Colour Solutions:

- VIVO ColourCloud: Recipe Downloads
- VIVO ColourPortal: Colour Services



# Masterclass Training | What does this mean?



Technical  
Support



Digital  
Solutions



Masterclass  
Training



Professional  
Services



Masterclass  
Training

- Training on our ink products
- Colour management modules
- Workflow management
- Dispenser programmes
- Ink handling
- Ink kitchen setup
- Troubleshooting



# VIVO Colour Solutions



# What is VIVO Colour Solutions?

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- Flint Group's VIVO Colour Solutions is a collection of consultancy, services and cloud based tools for colour management to deliver measurable benefits
- Developed to achieve colour consistency, 'Right First Time' printing and reduce the overall 'Total Cost to Print'
- Through VIVO Colour Solutions, Flint Group's customers have access to:
  - Colour and ink management service programmes
  - A modular colour management toolbox
  - Single and multi-site functionalities with quality control, ensuring consistent brand compliance anywhere in the world
  - Process improvements
  - Multiple savings in efficiency, time, resource and waste reduction

Providing excellence in colour and press-side management



# An overview of VIVO Colour Solutions

## Productivity

**vivo** | *ColourCloud*

Downloadable achievable colour standards with associated ink recipes

**vivo** | *ColourPortal*

Digital requesting of colour related data; recipes, CxF

**vivo** | *DigiSystem 3.0*

Creation of physical printable colours based upon the digital colour standard

**vivo** | *ColourConnect*

Direct link to send recipes to ink dispensers

## Process Control

**vivo** | *ColourSuite*

Quality control of printed colour versus brand owner colour standard

**vivo** | *ColourFix*

Quick and easy colour/recipe correction press side

**vivo** | *PerformanceManager*

Data analytics based on big data from VIVO ColourSuite; right first time, lost time analysis

**vivo** | *ColourNetwork*

Centrally managed storage of colour standards

## Reproduction

**vivo** | *DigiSwatch*

On-demand, site based digitally printed swatch guide

**vivo** | *ColourBook*

Visual guide of Flint Groups interpretation of PMS printed on Brown Kraft paper

**vivo** | *ColourStandards*

Press achievable colour standards for brand owners and for quality control

**vivo** | *ColourGuide*

Bespoke digitally printed guide based upon your digital colour library

# VIVO ColourCloud – Instant Access to Colour Data

*Rely on us.™*

## VIVO ColourCloud provides...

- Faster colour approval and increased speed to market
- Increased Right First Time
- Identical data across multiple sites
- Consistent colour output

## By equipping you with...

- A database of colour standards and recipes accessible 24/7
- Colour data produced by industry experts
- Instant ink recipe download correlated to your press specification





# VIVO ColourPortal – Streamlining Communication

*Rely on us.™*

## VIVO ColourPortal provides...

- Bespoke colour matching suited to your and your customers' needs
- A direct link to dedicated colour experts
- A wide range of colour related activities

## By equipping you with...

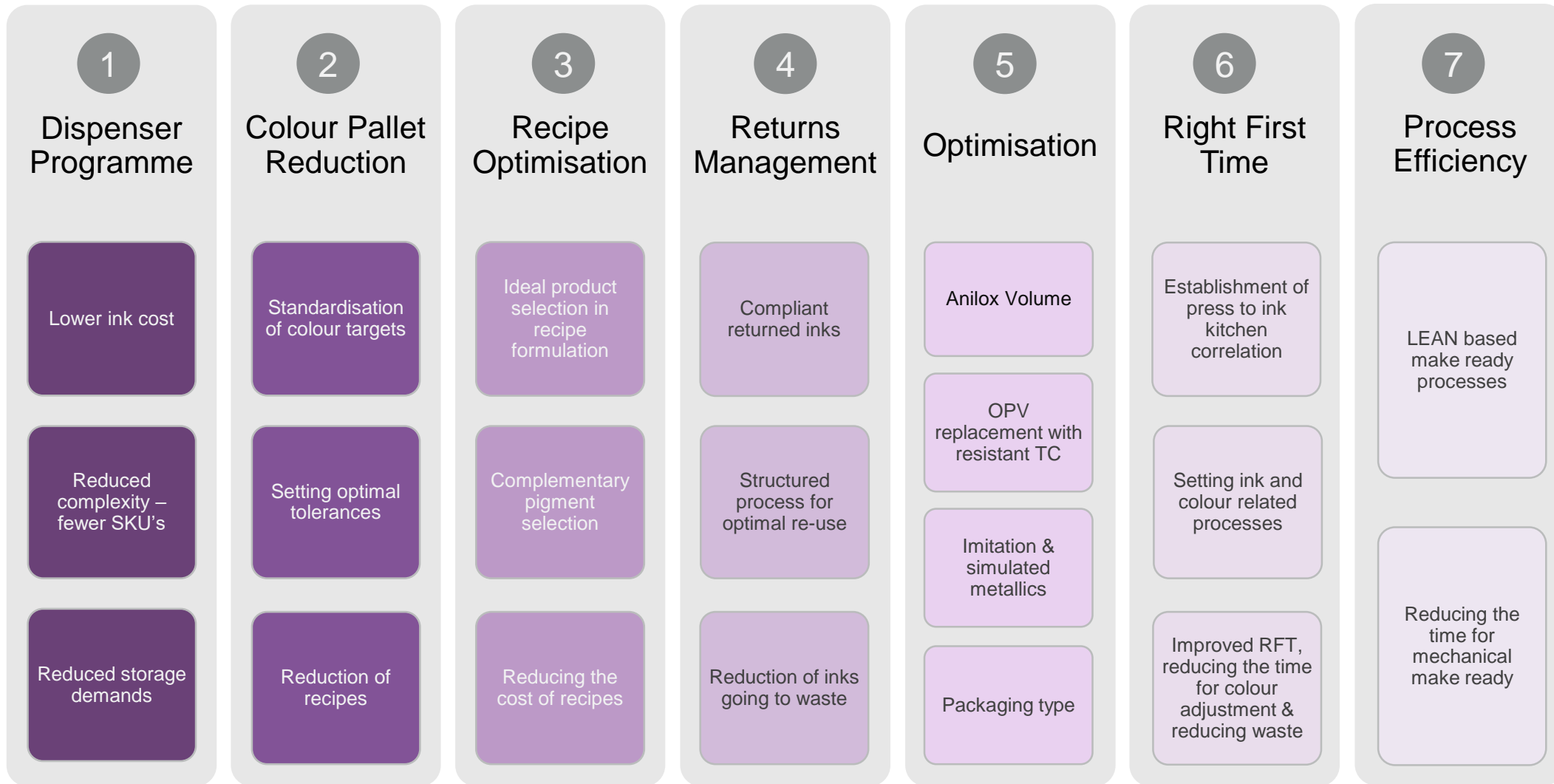
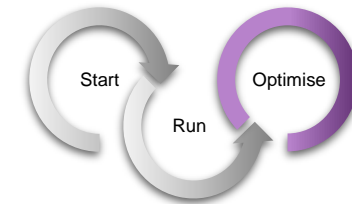
- A user-friendly, web-based communication platform, available in multiple languages



# Value Creation Programmes



# Value Creation Programmes (VCP)



# Regulatory changes

*Past, Current & Upcoming  
Changes*

# Raising the Bar for Safety and Performance

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## **Challenging - and for good reason!**

- Safer working conditions in our facilities
- Safer print and packaging for our customers

# Flint Group's approach to regulatory changes

## *Compliance*

- **Leading the regulatory landscape**
  - Dedicated resources for Regulatory compliance within R&D
  - Active participation to EuPIA meetings

## *Proactiveness*





- **Leading the market**
  - Proactive approach to regulatory changes – collaboration with suppliers
  - Internal watch of possible incoming regulatory changes

## *Collaboration*

- **Customer support**
  - Dedicated regulatory contact
  - Best practice training and support

# Key Regulatory Developments Impacting Inks

## Past, Current & Upcoming Changes

	2023			2024				2025				2026				2027			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2		
TPO Omnirad 379	▲ Reclassification																		
TMPTA TCDDA				▲ Reclassification								▲ Reclassification							
PFAS MOSH/MOAH BPA												▲ Ban in FCM							
				▲ Phase 1				▲ Phase 2											
GIO												Planned implementation				Postponed implementation			

# Key compliance factors in food packaging

# Flint Group's development for UV curable FCM inks

## The 2 key factors to FCM compliance

**RAW  
MATERIAL  
SELECTION**



**ADAPTED  
PROCESS**



**GMP  
GOOD  
MANUFACTURING  
PRACTICES**

# Safety of food packaging

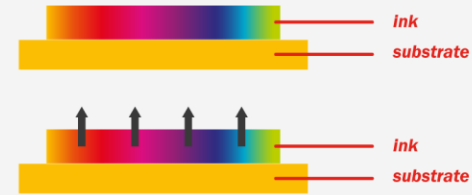
## 1 Penetration Migration

Penetration through the substrate to the reverse side of the print



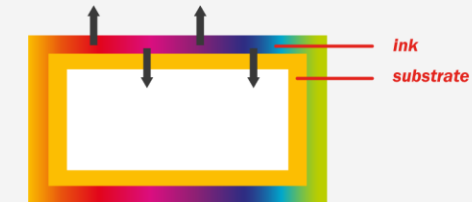
## 2 Set-off Migration

Set-off from the print to the reverse side while being stored in a pile (\*invisible set-off\*)



## 3 Vapour phase Migration

Volatilisation of compounds during cooking

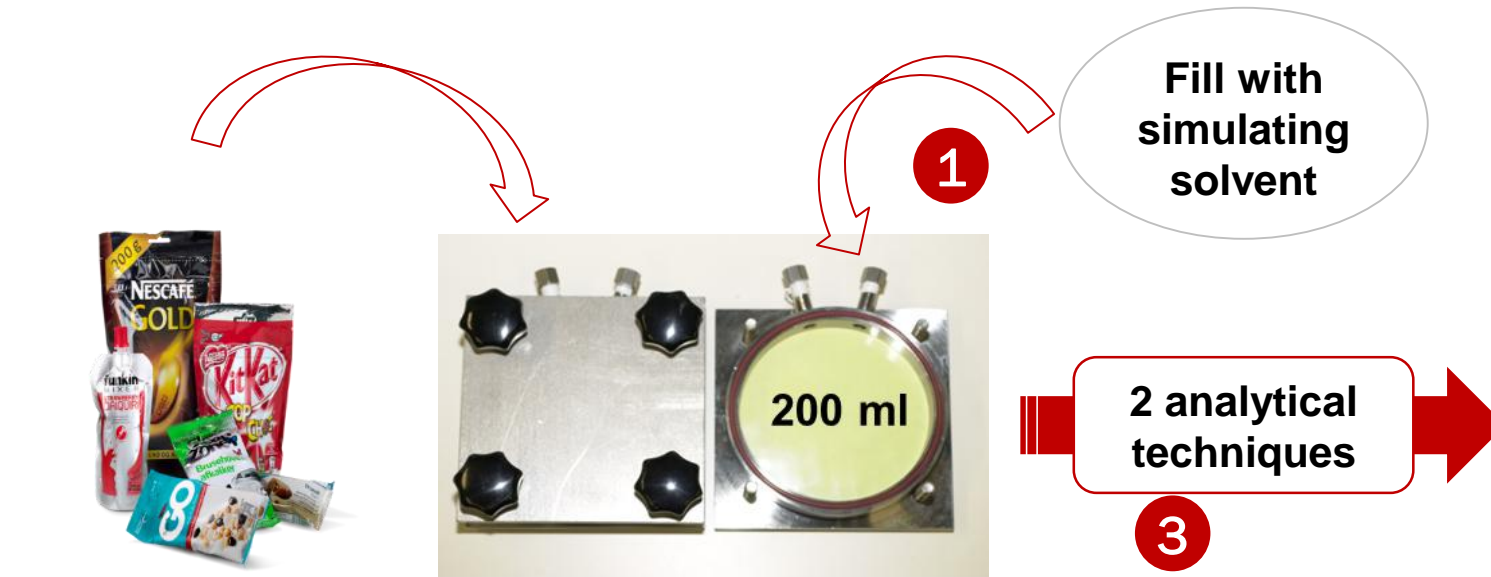


## 4 Condensation Extraction

Condensation of critical components when cooking/sterilisation



# Migration testing set-up



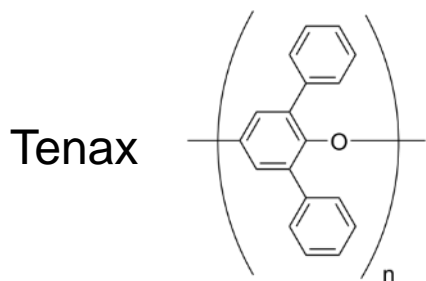
UV cured samples

*Maturi Cell*

**2** Exposure conditions:  
 Direct or indirect contact  
 Temperature: RT, 40°C, ..  
 Time: 1, 3 or 10 days

# 1. Choice of the food simulatant

Food types	Food simulants
Aqueous, non-acidic and non-alcoholic foods	10% ethanol (in water)
Alcoholic foods (< 20%)	20% ethanol (in water)
Dairy products and high-alcohol beverages (> 20%)	50% ethanol (in water)
Acidic foods (pH < 4.5)	3% acetic acid (in water)
Fatty foods	Vegetable oil (substitute: 95% ethanol (in water))
Dry/high temperature food	Tenax = poly(2,6-diphenyl-p-phenylene oxide)
<b>UNIVERSAL SIMULANT</b>	<b>95% ethanol (5% water)</b>



## 2. Choice of the exposure test conditions

- Indirect contact with food simulant
- Temperature: RT, 40°C, ...
- Duration: 1, 3, 10 days, ...

**Migration testing must be conducted under the most severe conditions of temperature and time anticipated for the proposed use**

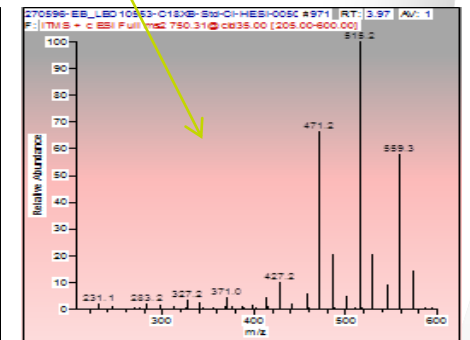
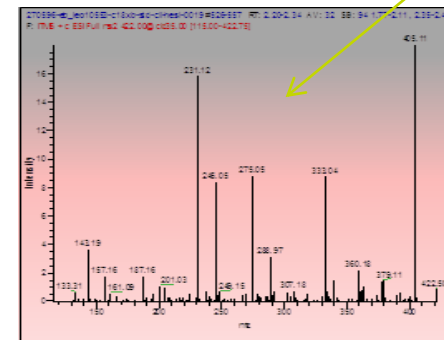
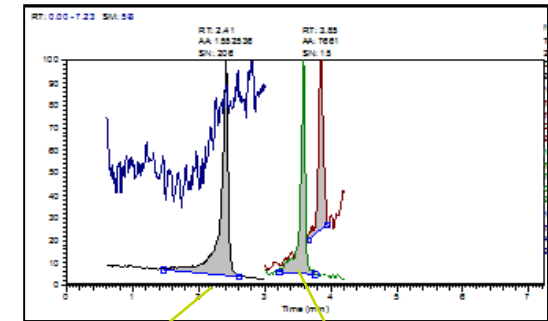
Temperature in which food is consumed	Test temperature	Time
Room Temperature	40°C	10 days
Refrigerated or frozen	20°C	10 days
Microwave and oven	120°C	30 min to 1H

# 3.1 Identification and Quantification of Migrants

A

## Liquid Chromatography with Mass Spectrometry (LC-MS)

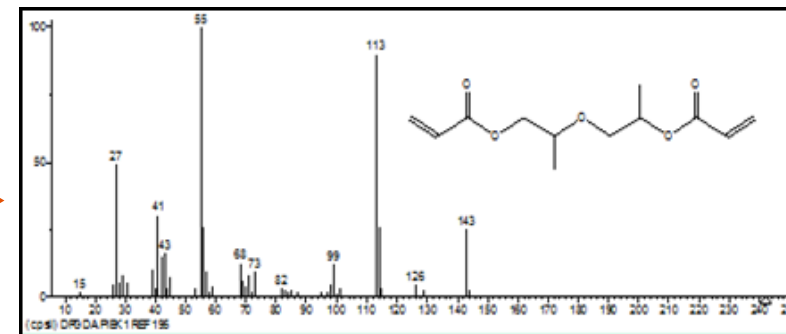
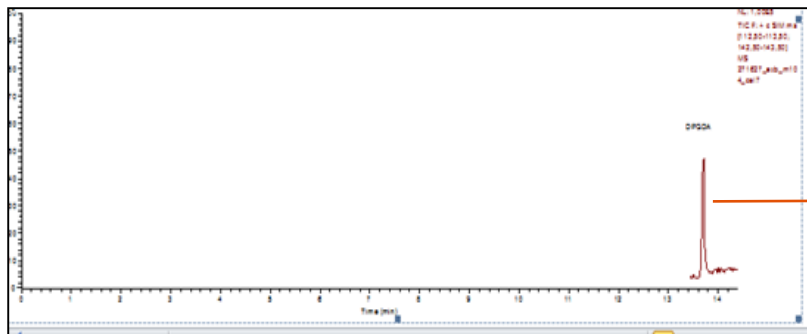
- Both volatile and non-volatile compounds
- Identification of migrants in food simulants
- Quantification of **low and High Mw ingredients** (Mw < 2500 Daltons)



# 3.2 Identification and Quantification of Migrants

## B Gas Chromatography with a Mass Spectrometry detector (GC-MS)

- Volatile and many organic-soluble analytes
- Identification of migrants in food simulant
- Quantification of **low Mw ingredients** (Mw < 500 Daltons)





**thank  
you**

We bring

**COLOUR**

to the world

**Flint**Group