ZELLER+GMELIN

Preparing for the German Ink Ordinance

Sales Conference 2025

EXPERTLY DONE.

Let‘s start where we finished last year

Summary 2024

+ **The marked for food packaging will significantly change in the next 6 years**
+ This might be the biggest change since the ITX crises
+ Not all UV inks in the market today will be fit for this change
+ New concepts and ink series/OPVs/… have to be established
+ **We are prepared!**

Timeline

03/2025
Salesmeeting

01/2026
German Ink Ordinance has to be applied

Q4 2025
Publication of first EU Recyclability Standards (D4R)

08/2026
First PPWR rules apply (e.g. PFAS limits in FCM)

06/2026
BPA-Ban in FCM has to be applied

01/2028
D4R-Standards has to be applied

2030
Recycling-targets apply

Ban of non-recyclable/hard to recycle packaging

02/2026
Revised Swiss Ink Ordinance has to be applied

Q4 2027
1. Revision of D4R-Standard

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All timelines apply to the printed article compliant inks have to be available much earlier

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The German Ink Ordinance in detail

German Ink Ordinance (GIO)

+ German national legislation/part of “consumer goods ordinance”
+ **printed food contact materials in scope (not inks)**
+ Compliance needs to be demonstrated for the final article
+ **transition period for placing on the marked(!) ends 31.12.2025**
+ **positive list of permitted substances (less than SR817.023.21)**
+ **10ppb limit for non listed/non CMR substances**

German Ink Ordinance (GIO)

Applies to

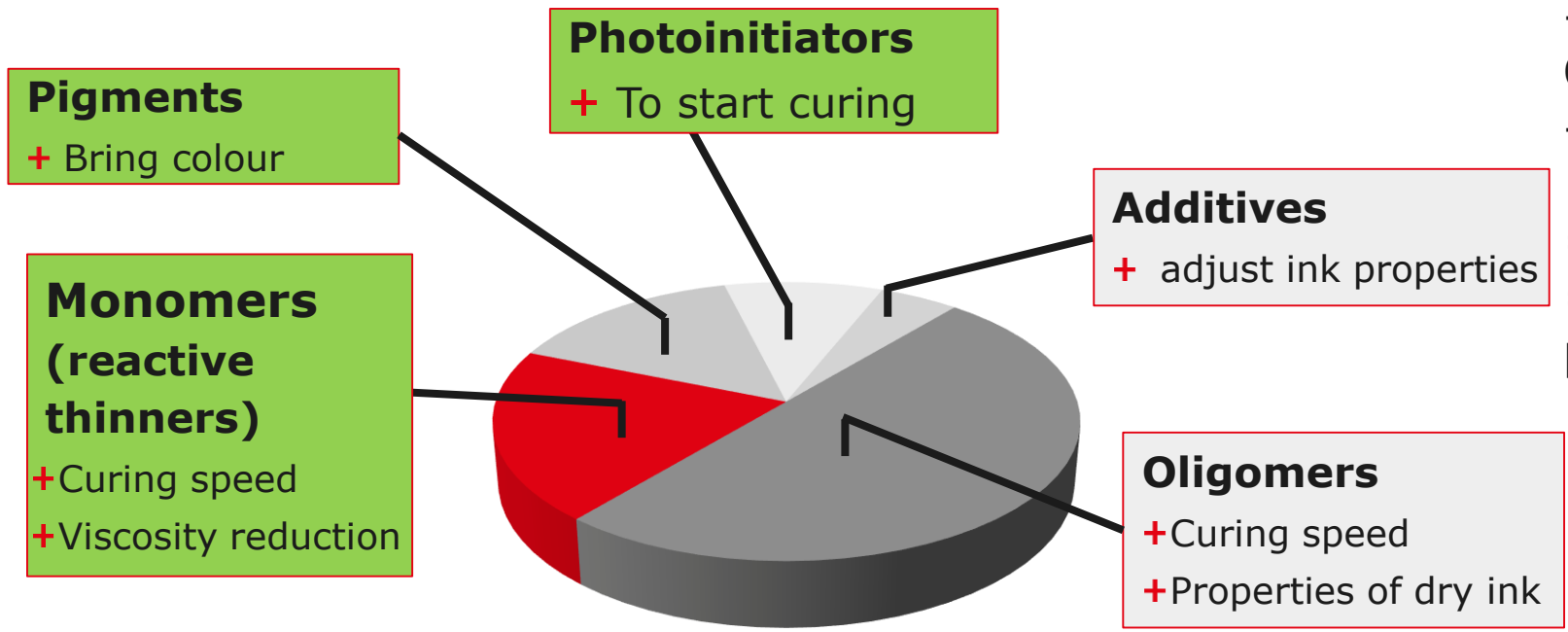
+ Printed food packaging marketed in Germany (also imports)
+ Likely to become new EU industry standard for FCM inks

Does not apply to

+ All other countries
+ Pharma packaging
+ Cosmetics packaging

Non GIO-compliant products can still be manufactured and sold but their use for food packaging is illegal in Germany.

GIO-Requirements



1. Requirements for substances:

- Listed in Annex 14 / EU10/2011

Or

- non-CMR

=> Relevant for migration testing
=> Compliance check via MSDS possible

GIO-Requirements

Pigments
+ Bring colour

Photoinitiators
+ To start curing

Additives
+ adjust ink properties

Monomers (reactive thinners)
+Curing speed
+Viscosity reduction

Oligomers
+Curing speed
+Properties of dry ink

3. Migration limits:
=> SML or <10ppb
=> Apply to the final article.

1. Requirements for substances:
- Listed in Annex 14 / EU10/2011

Or
- non-CMR

=> Relevant for migration testing
=> Compliance check via MSDS possible

2. Requirements for polymers:
Starting materials…
- Listed in Annex 14 / EU10/2011

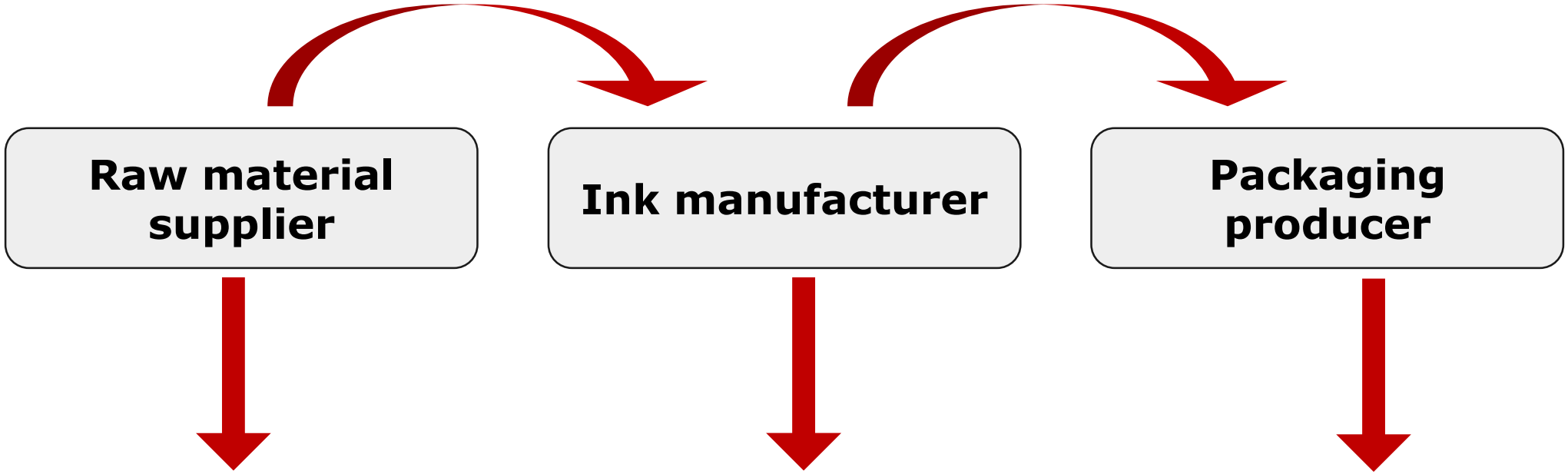
Or
- non-CMR

=> Rarely relevant for migration
=> Compliance check only by supplier confirmaton

EXPERTLY DONE.

Responsibilities along the supply chain

Confirm compliance of raw material composition
Provide details on potential migrants



Main consequences for energy curing inks

+ **Direct food contact is <u>prohibited</u> for energy curing inks**
  In the past it was “only” not recommended

+ **Some UV FCM raw materials do not meet GIO requirements**
  Reformulation required for FCM products

+ **Migration limits of photoinitiators will be lowered significantly**
  (Some packaging compliant today, printed with an ink that fulfils GIO composition requirements may still be none-compliant)

GIO and our FCM portfolio

Where we are with our products

Rigid Plastic

+ Yogurt cups
+ Plastic tubes
+ Plastic buckets
+ Plastic caps

+ When PI379 was replaced GIO-compliance was already taken into account

+ UVACURID C81 is GIO-compliant

+ UVACURID T581 will be GIO-compliant

+ Products with PI379 do not meet the requirements (customers have to print and sell their “old” UVACURID C81 an UVACURID T81 prior to 01/2026)

Where we are with our products

Metal Decoration

+ Metal packaging
+ Aerosol cans
+ Aluminium tubes / bottles
+ Crown caps
+ Closures

+ Current Metal Deco portfolio is GIO-compliant (inks and varnishes, conventional and UV)

+ UVALUX U3/UVALUX L9-U3 are not GIO compliant

Where we are with our products

Packaging

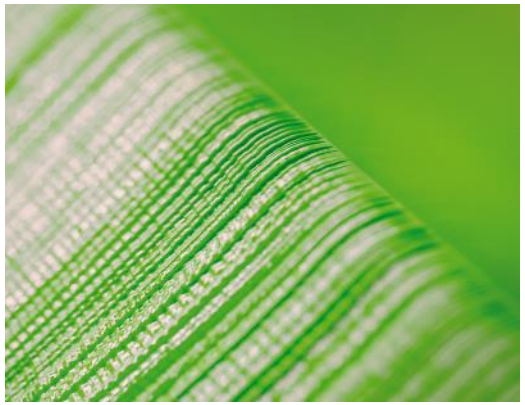
+ Cardboard packaging
+ Plastic packaging
+ Flexible packaging
+ Stand-up pouches

+ When PI379 was replaced GIO-compliance was already taken into account

+ Only a few non-compliant opaque whites exist (U71-X55007, U81-X55401)

+ Alternatives are available for testing

Where we are with our products



Narrow Web

+ Self-adhesive labels
+ Shrink-sleeve labels
+ In-mould labels
+ Wrap-around labels

+ **UVAFLEX FCM Y81**
  Most ink shades contain a non-compliant raw material
  => UVAFLEX FCM Y81 is not GIO-compliant

+ New formulation UVAFLEX FCM Y81 in preparation. First print trials CMYK planed for next week.

+ **UVAFLEX FCM LED Y581**
  contains one non-compliant ink shade:Y581-ZKN01SR

+ GIO compliant alternative to Y581-ZKN01SR available for testing

Where we are with our products

Lacquers + Adhesive

- \+ Finishing coatings
- \+ Protective coatings
- \+ Adhesive systems

+ **Overprinting varnishes:**
  - + Many YL-FCM varnishes contain intentionally added TMPTA which makes them non-compliant
  - + Alternatives available for testing
  - + When rebranding OPTIFLEX varnishes to UVAFLEX YL-… only the ones meeting GIO got the “FCM” label

Where we are with our products

Lacquers + Adhesive

+ Finishing coatings
+ Protective coatings
+ Adhesive systems

+ **Cold foil adhesives:**
  + EURALUX products (OL-8…FCM) are GIO compliant
  + New UVALUX products (LU-8…FCM) are GIO compliant
  + LY-8CT01FCM is non-compliant, alternative is in development

+ **Lamination adhesives:**
  UVAFLEX VU0800LM is non-compliant, alternatives are available for testing

Additional regulatory changes in 2026

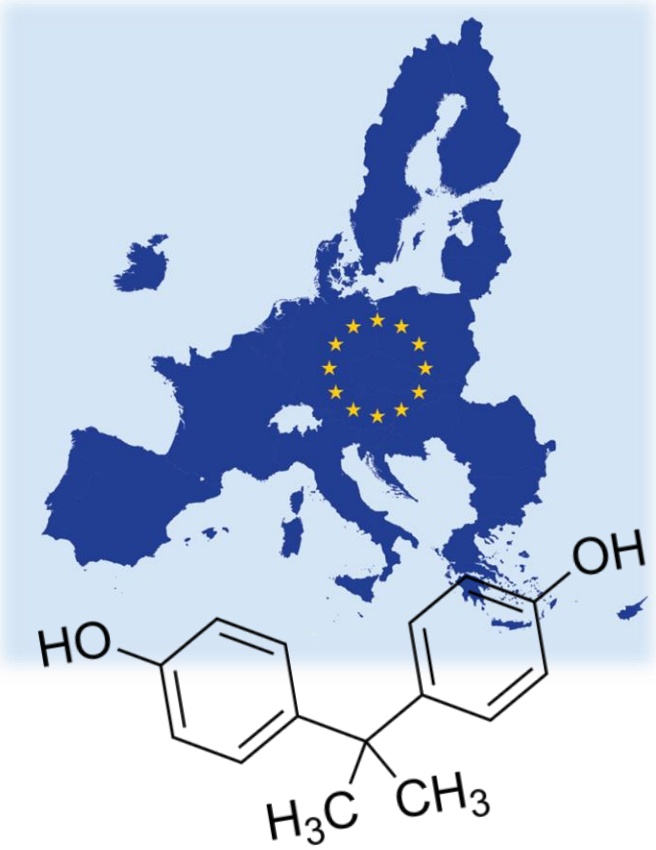
Swiss ink ordinace (SR817.023.21)

- **Revision adopted 01.02.2024**
- **Transition till 31.01.2026**
- **Alignment with German ink ordinance**
  (up to a certain degree…)
  - Removal of B-List
  - Introduction of a 10ppb-limit for all non-CMR substances
- **Additional compliance documents mandatory**

Criteria met by GIO-compliant products

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

EU ban of BPA in Food Contact Materials



+ Revised EU-FCM-Regulations (EC1935/2004 + EU10/2011)
+ Ban of intentionally used Bisphenol A
+ Strict limits for unintentional added BPA
+ **Ban of BPA-based raw materials in inks/varnishes/adhesives for food packaging from June 31st 2026 on.**
+ **Some "older" low migration products (prior 2017) still contain BPA-based raw materials**
  => Check TDS for BPA-NI

EU ha… in Food Contact materials

…vised EU-FCM-Regulations (EC1935/2004 + EU10/2011)

Formulation	Suitable for FCM applications - VOC-free - BPA-NI - Non-DFC

… limits for unintentional added BPA

…f BPA-based raw materials in …arnishes/adhesives for food packaging from …st 2026 on.

…der" low migration products (prior 2016) …in BPA-based raw materials

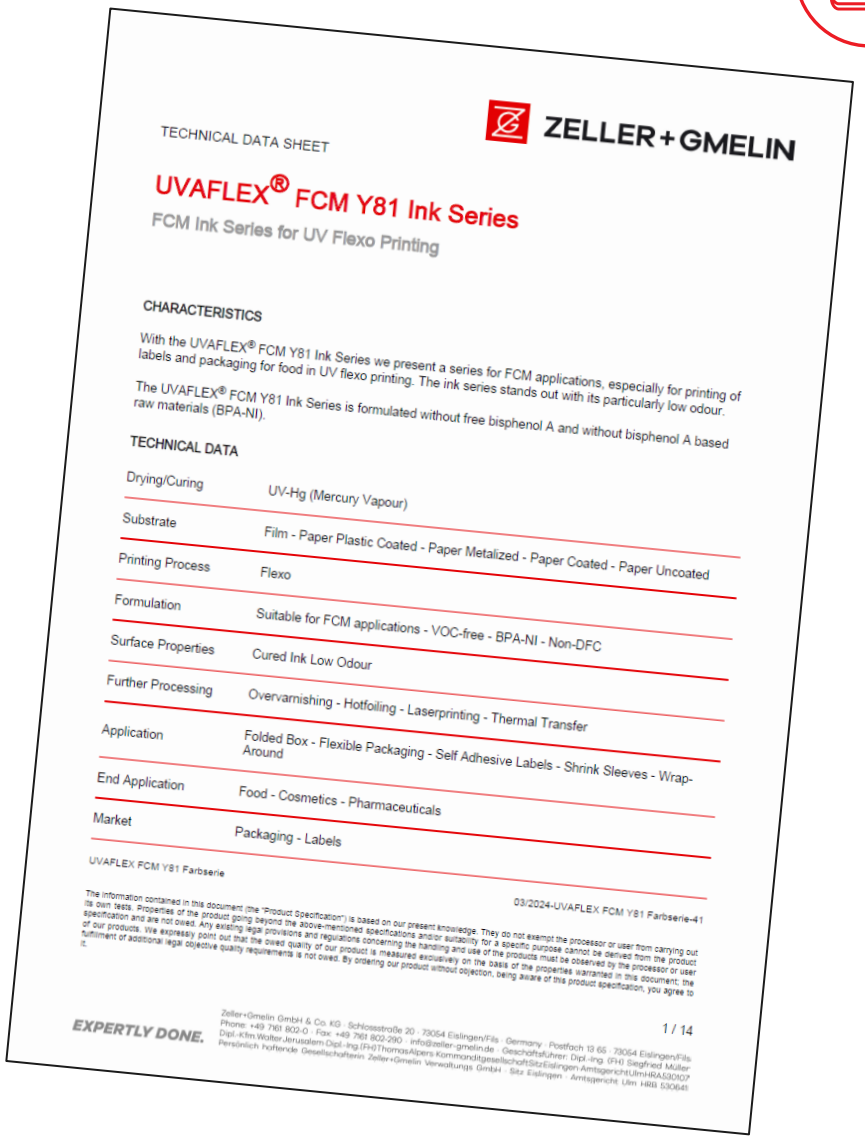
…DS for BPA-NI

Final conclusions

FCM @ Zeller+Gmelin

Products labelled as FCM:

+ Comply with the EuPIA Excusion policy
+ Composition complies with Swiss Ink Ordinance (SR817.023.21)
+ Migration was evaluated
+ Meets Nestlé Standard for packaging inks
+ No BPA-based raw materials
+ No mineral oil
+ No phthalates



TECHNICAL DATA SHEET

ZELLER+GMELIN

UVAFLEX® FCM Y81 Ink Series

FCM Ink Series for UV Flexo Printing

CHARACTERISTICS

With the UVAFLEX® FCM Y81 Ink Series we present a series for FCM applications, especially for printing of labels and packaging for food in UV flexo printing. The ink series stands out with its particularly low odour.

The UVAFLEX® FCM Y81 Ink Series is formulated without free bisphenol A and without bisphenol A based raw materials (BPA-NI).

TECHNICAL DATA

Drying/Curing	UV-Hg (Mercury Vapour)
Substrate	Film - Paper Plastic Coated - Paper Metalized - Paper Coated - Paper Uncoated
Printing Process	Flexo
Formulation	Suitable for FCM applications - VOC-free - BPA-NI - Non-DFC
Surface Properties	Cured Ink Low Odour
Further Processing	Overvarnishing - Hotfoiling - Laserprinting - Thermal Transfer
Application	Folded Box - Flexible Packaging - Self Adhesive Labels - Shrink Sleeves - Wrap-Around
End Application	Food - Cosmetics - Pharmaceuticals
Market	Packaging - Labels

UVAFLEX FCM Y81 Farbserie

03/2024-UVAFLEX FCM Y81 Farbserie-41

The information contained in this document (the "Product Specification") is based on our present knowledge. They do not exempt the processor or user from carrying out its own tests. Properties of the product going beyond the above-mentioned specifications and/or suitability for a specific purpose cannot be derived from the product specification and are not owed. Any existing legal provisions and regulations concerning the handling and use of the products must be observed by the processor or user of our products. We expressly point out that the owed quality of our product is measured exclusively on the basis of the properties warranted in this document; the fulfilment of additional legal objective quality requirements is not owed. By ordering our product without objection, being aware of this product specification, you agree to it.

EXPERTLY DONE.

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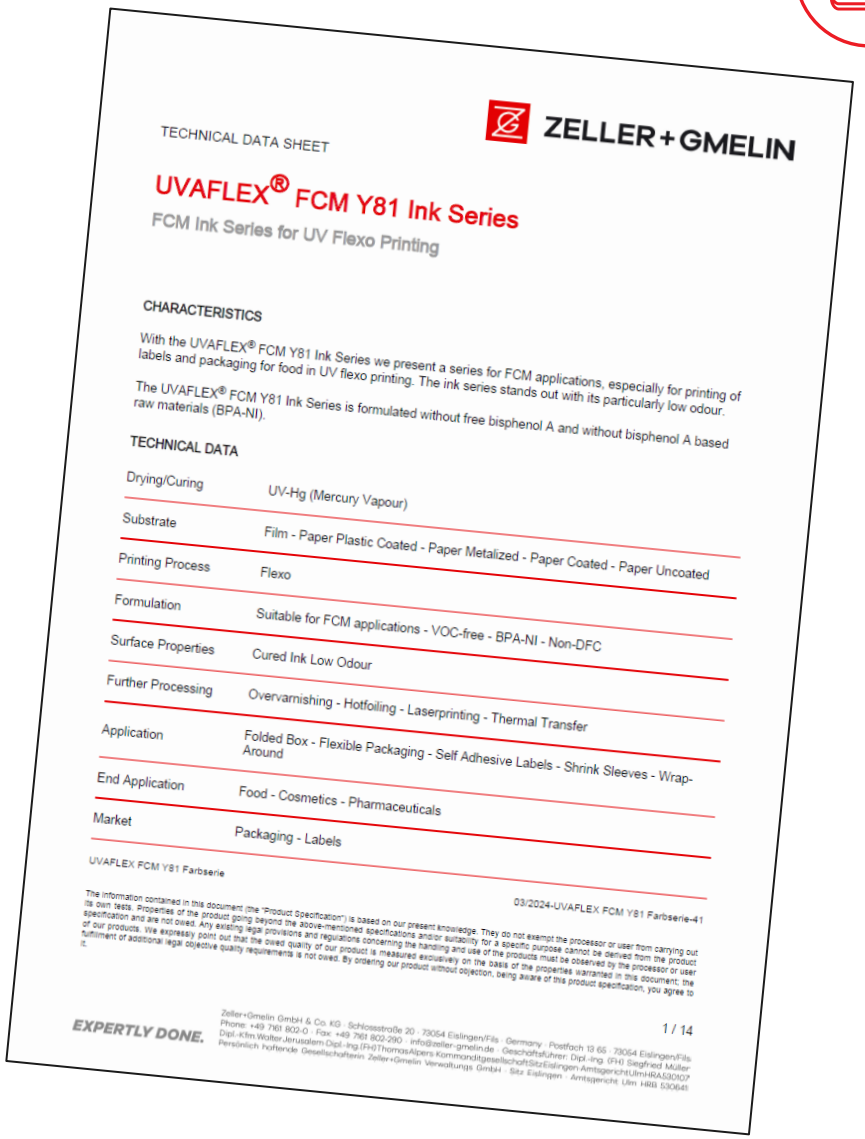

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Check with your customers

1. **Do they print food packaging marketed in Germany?**

2. **Is the ink GIO compliant?**
   + E.g. (check MSDs section 3 for CMRs: H340/H350/H360/H341/H351/H361)
   + Get supplier confirmation

3. **Are ink components migrating above 10ppb?**
   + If yes, are they listed in Annex 14 of the BedGgstV or EU10/2011 and meet their SML?

Final summary

2026 is closer than you might think!

+ German Ink Ordinance will be enforced 01/2026 for all printed food packaging marketed in Germany
+ Migration limits will be lowered!
+ Non-GIO compliant products can still be manufactured and used for other sensitive applications (e.g. pharma/cosmetics) or food packaging outside Germany
+ When replacing PI379 we already made these products fit for GIO
+ For many non-compliant articles alternatives are available for testing or in the pipeline
+ **We are prepared!**


ZELLER+GMELIN
Thank You!