



## TECHNICAL DATA SHEET

# UVAFLEX<sup>®</sup> FCM Y81 Ink Series

## FCM Ink Series for UV Flexo Printing

### CHARACTERISTICS

With the UVAFLEX<sup>®</sup> 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<sup>®</sup> 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

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Conformities	Nestlé, Standard on Printing Inks for Food Packaging (St-80,001) - Switzerland, 817.023.21
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Available Systems	4 Colour Process - PANTONE <sup>®</sup> Base Colours - Z Base Colours
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### SUBSTRATES

#### Influence of the Substrate on Migration Behaviour

The substrate has a strong influence on the migration behaviour of several substances. We recommend to use printing materials which show good barrier properties.

Generally no absorbent substrates (like paper) should be used for printing flexible packaging. Due to the open structure ink components may penetrate deep into the material which may result in insufficient cross linking during the curing process. The consequence may be the exceeding of legal limits because of migration or set off.

### PACKING UNITS

+ 5 kg Plastic Bucket (black)

### TECHNICAL SERVICE CENTER

Kindly note that we are ready at any time for competent technical application support on your site. Please contact our technical service centre for printing inks:

Ink-Service@Zeller-Gmelin.de  
Tel: +49 7161 802-279

### COVERING WHITES

UVAFLEX<sup>®</sup> FCM Y81 types of opaque white are characterized by their high opacity at low ink lay down. All types of opaque white are resistant against spirit, solvent mixture and alkali (according to DIN 16524).

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### UVAFLEX<sup>®</sup> FCM Y81-X55001 - Standard, non-dyed

FCM standard opaque white with an extreme degree of whiteness and good opacity.  
Non-dyed, good overprintable, recommendation anilox roller: 6-10 cm<sup>3</sup>

### UVAFLEX<sup>®</sup> FCM Y81-X55401 - Standard, violet dyed

FCM standard opaque white with a high degree of whiteness and good opacity.  
Violet dyed, good overprintable, recommendation anilox roller: 6-10 cm<sup>3</sup>

### UVAFLEX<sup>®</sup> FCM Y81-X55051 - Sleeves, non-dyed, not overprintable

FCM opaque white for shrink-sleeve applications. Very good slip properties.  
Non-dyed, not overprintable (COF <0,15), recommendation anilox roller: 6-10 cm<sup>3</sup>

### UVAFLEX<sup>®</sup> FCM Y81-X55052 - Sleeves, non-dyed, overprintable

FCM opaque white for shrink-sleeve applications but without silicone. Especially for sleeves on conical cups in combination with positioning adhesives.  
Non-dyed, overprintable, recommendation anilox roller: 6-10 cm<sup>3</sup>

### UVAFLEX<sup>®</sup> FCM Y81-X55061 - Sleeves, non-dyed, non wet-look

FCM opaque white for shrink-sleeve applications with very good shrinking properties, reduces sticking of the sleeve to the packaging ("Non Wet-Look")  
Non-dyed, good overprintable, recommendation anilox roller: 6-10 cm<sup>3</sup>

### UVAFLEX<sup>®</sup> FCM Y81-X55452 - Lids, violet dyed

FCM odour-reduced opaque white specially for primed aluminium lids.  
Violet dyed, good overprintable, recommendation anilox roller: 6-10 cm<sup>3</sup>

## ADDITIVES

### W963 UV Wash Up with Lemon Smell

Suitable for cleaning inking systems, sleeves, plates, blankets, etc.  
Not approved for automatic washing units.

Before starting printing, the washing agent must be completely dried off, otherwise the printing behaviour may be impaired.

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### Remark:

The addition of any additive might change the overall characteristics of the printing ink.

### STORAGE

#### Optimal storage conditions:

The optimal storage temperature is 20°C. Higher storage temperatures reduce the shelf-life.

#### Remarks:

- protect from frost
- store in a cool and dark place
- stir or shake well before use
- can should be closed immediately after usage

#### Warranty:

If the products are stored properly, we warranty the product performance for a shelf life of 12 months from the date of delivery. Deviating from this, we warranty only 6 months product performance for all deliveries in large containers over 10kg filling quantity. For metallic inks, we generally warranty only 3 months ink performance.

### PRACTICE REMARKS

#### Printing Materials

We recommend using ester and ketone resistant rollers (EPDM-material). The inking roller, rubber blanket and printing plate have to be resistant against UV-inks and UV-detergents (see manufacturers instructions).

#### Information about Light Resistance

All light resistances are indicated according to the blue wool scale (BWS) and are based on the product specifications of our pigment suppliers. Light resistance can change when mixing inks and when printing halftone. Depending on the mixing ratio and on the fineness of the screen the light resistance can be lower than the pure solid colour.

#### Curling

Because of having a high reactivity the products may show the problem of "curling" under specific production conditions (rolling of the print towards the printed side). Possible Causes:

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- Too high ink lay down
- Using very thin substrates
- UV radiation is too high
- Adhesive strength of self-adhesive labels is too low

Generally we recommend that the products are checked in advance under production conditions for their suitability.

### Further Processing of Metallic Inks

Metal pigments can have an influence on further processing. For example problems may occur with overvarnishing, even if the metal pigments are mixed into overprintable inks. Also finishing such as thermal transfer printing, laminating or hotfoiling can be influenced. Please note that inks with metal pigments may have a lower scuff-resistance than standard inks, depending on ink lay-down, substrate and press speed.

### Sterilising resistance

Suitability for heat sterilising according to DIN16524-5:

Y81-S1100 - Yes  
Y81-S1200 - No  
Y81-S1300 - Yes  
Y81-S1400 - Yes

Y81-ZYN01 - Yes  
Y81-ZYN02 - Yes  
Y81-ZYG01S - No  
Y81-ZON01R - Yes  
Y81-ZON02S - No  
Y81-ZRY01 - Yes  
Y81-ZRB01 - No  
Y81-ZRP01SR - Yes  
Y81-ZRY02SR - Yes  
Y81-ZRB02SR - Yes  
Y81-ZVN01SR - Yes  
Y81-ZBG01SR - Yes  
Y81-ZGN01SR - Yes  
Y81-ZKN01SR - Yes

Y81-P100 - Yes

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Y81-P101 - No  
Y81-P150R - Yes  
Y81-P200 - Yes  
Y81-P201 - No  
Y81-P202 - No  
Y81-P203SR - Yes  
Y81-P250SR - Yes  
Y81-P251SR - Yes  
Y81-P300SR - Yes  
Y81-P301SR - Yes  
Y81-P302SR - Yes  
Y81-P350SR - Yes  
Y81-P400SR - Yes

### Sterilisation of Metallic Inks

Depending on the sterilisation process, a change in gloss or greying of metallic pigments cannot be ruled out. Due to the numerous different sterilisation methods and their parameters, we are unable to make a statement on the sterilisability of metallic inks. We therefore recommend that you check the sterilisability with pre-tests under your production conditions. This applies to ready-to-print gold and silver inks and to mixes with metallic pastes.

### Preliminary Tests Recommended

Before beginning to print we recommend practice oriented pretests on your substrate, in order to test the desired characteristics of the finished product.

## MARKING

### Marking according to EC legislation:

Our inks are classified and marked according to EC legislation and the German "Gefahrstoffverordnung" (German dangerous substances regulation).

The material safety data sheet (MSDS) is available on request.

## PRODUCT DESIGNATION

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### Process Inks CMYK:

Y81-S... Standard Process Inks

### Zeller+Gmelin Base Inks:

Y81-Z... high intensity monopigmented base inks

### PANTONE<sup>®</sup>:

Y81-P... PANTONE<sup>®</sup> base inks

Y81-P...S PANTONE<sup>®</sup> base inks, high light resistance

Y81-C... PANTONE<sup>®</sup> mixed shades "coated"

Y81-U... PANTONE<sup>®</sup> mixed shades "uncoated"

**Special Colours:** Y81-X...

**Covering White:** Y81-X55...

**Transparent White:** Y81-X60001

### PANTONE<sup>®</sup> Metallic print ready one-component base inks:

Y81-P871 PANTONE<sup>®</sup> Gold (corresponds approximately to richgold)

Y81-P872 PANTONE<sup>®</sup> Gold (corresponds approximately to richpalegold)

Y81-P873 PANTONE<sup>®</sup> Gold

Y81-P874 PANTONE<sup>®</sup> Gold (corresponds approximately to palegold)

Y81-P875 PANTONE<sup>®</sup> Gold

Y81-P876 PANTONE<sup>®</sup> Gold

Y81-P877 PANTONE<sup>®</sup> Silver (Container contents differing from standard: 4 kg)

## MISCELLANEOUS

### Intense Black Types for the Use as Spotink

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### UVAFLEX<sup>®</sup> FCM Y81-X40101 - Solid Black

Special black for printing large solid areas with high ink laydown. Due to its tinting a visually deep black shade can be achieved. The high reactivity allows an ink laydown up to 2 g/m<sup>2</sup> (Anilox appr. 6-8 cm<sup>3</sup>/m<sup>2</sup>) with good scratch resistance.

### UVAFLEX<sup>®</sup> FCM Y81-X40102 - Solid Black

Special black for printing large solid areas with high ink laydown. Highly pigmented and without tinting for a deep, neutral black shade. The very high reactivity allows an ink application of up to 2g/m<sup>2</sup> (anilox approx. 6-8 cm<sup>3</sup>/m<sup>2</sup>) with good scratch resistance.

### UVAFLEX<sup>®</sup> FCM Y81-X40200 - Verification Black

Black with silicone for printing register marks on the backside of label carrier material. Not overprintable.

### UVAFLEX<sup>®</sup> FCM Y81-X40301 - Lid-Black

Odour-reduced black specially for primered aluminium lids.

### UVAFLEX<sup>®</sup> FCM Y81-X40302 - Matt Black

Black with silk matt surface for printing partial matt black areas without additional matt lacquer.

## RESISTANCE PROPERTIES

Colour Name	Article Number	Light Resistance	Spirit Resistance	Solvent Resistance	Alkali Resistance
<b>4 Colour Process</b>					
Yellow	Y81-S1100	4 BWS	+	-	+
Magenta	Y81-S1200	5 BWS	+	+	-
Cyan	Y81-S1300	8 BWS	+	+	+
Black	Y81-S1400	8 BWS	+	+	+
<b>PANTONE<sup>®</sup> Base Colours</b>					
Yellow	Y81-P100	5 BWS	-	-	+
Yellow 012	Y81-P101	4 BWS	-	-	-
Orange 021	Y81-P150R	5 BWS	+	+	+

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Warm Red	Y81-P200	4 BWS	-	-	+
Red 032	Y81-P201	4 BWS	-	-	+
Rubine Red	Y81-P202	5 BWS	+	+	-
Rhodamine Red	Y81-P203SR	6 - 7 BWS	+	+	+
Bright Red	Y81-P204	4 BWS	-	-	+
Pink	Y81-P206SR	6 - 7 BWS	+	+	+
Purple	Y81-P250SR	6 - 7 BWS	+	+	+
Violet	Y81-P251SR	6 - 7 BWS	+	+	+
Medium Purple	Y81-P252SR	6 - 7 BWS	+	+	+
Reflex Blue	Y81-P300SR	8 BWS	+	+	+
Process Blue	Y81-P301SR	8 BWS	+	+	+
Blue 072	Y81-P302SR	8 BWS	+	+	+
Dark Blue	Y81-P303SR	7 BWS	+	+	+
Green	Y81-P350SR	8 BWS	+	+	+
Black	Y81-P400SR	8 BWS	+	+	+
<b>Z Base Colours</b>					
Base Yellow	Y81-ZYN01	4 BWS	+	-	+
Base Yellow	Y81-ZYN02	5 - 6 BWS	-	-	+
Base Yellow - Green Shade	Y81-ZYG01S	7 BWS	+	+	-
Base Orange	Y81-ZON01R	4 BWS	+	+	+
Base Orange	Y81-ZON02S	7 BWS	+	+	-
Base Red - Yellow Shade	Y81-ZRY01	5 BWS	-	-	+
Base Red - Yellow Shade	Y81-ZRY02SR	7 BWS	+	+	+
Base Red - Blue Shade	Y81-ZRB01	5 BWS	+	+	-
Base Red - Blue Shade	Y81-ZRB02SR	6 BWS	+	+	+
Base Red - Pink Shade	Y81-ZRP01SR	6 - 7 BWS	+	+	+
Base Violet	Y81-ZVN01SR	6 - 7 BWS	+	+	+
Base Blue - Green Shade	Y81-ZBG01SR	8 BWS	+	+	+
Base Green	Y81-ZGN01SR	8 BWS	+	+	+
Base Black	Y81-ZKN01SR	8 BWS	+	+	+

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Base White Opaque	Y81-ZWO01SR	8 BWS	+	+	+
Transparent White	Y81-ZWT01		+	+	+

### REMARKS ON MIGRATION AND CONFORMITY

The following remarks are valid for the production of food packaging which complies with the regulations in the European Union. We are not able to provide statements concerning food packaging legislation of countries outside the EU.

Regulation (EC) No 1935/2004 requires that the person responsible for "placing on the market" of a packaging article must have an appropriate documentation available to demonstrate the compliance with the rules related to food processing and distribution.

Not only the used materials influence food-legislation related properties of a packaging. The production process of the packaging has a significant impact as well.

Therefore, we recommend our customers to send their finished products to a recognized analytical institute for examination and certification. That way compliance with legal requirements can be proven.

The transfer of substances from the packing into the filling is called migration. The following production parameters have a significant influence on the degree of migration:

- correct processing, especially the complete through-cure of the ink film
- type of substrate and substrate thickness (sufficient barrier properties of the substrate)
- prevention of a direct contact of the printing ink with the food
- selection of printing inks which are suitable for FCM applications

The UVAFLEX<sup>®</sup> FCM Y81 Ink Series is specially developed for FCM applications. Therefore, we recommend these products for printing of materials for food-packaging. The EuPIA designation "FCM" (food contact material) stands for products which are generally suitable for the production of food-packaging. Please note that our FCM products are designed for use on the packaging outside (Non-DFC). A direct contact of the filling with the printed image has to be avoided.

Due to the FCM formulation it is reasonable to assume that with these products the migration limit of the European Union should be well achievable (Regulation (EU) No 10/2011). Therefore, it should be possible to fulfil the legal requirements of Regulation (EC) No 1935/2004.

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We produce our low-migration products in accordance with Regulation (EC) No 2023/2006 (Good Manufacturing Practice, GMP). The resulting demands on printing ink manufacturers are detailed in the EuPIA-GMP (see [www.eupia.org](http://www.eupia.org)).

In general you should ensure by migration analysis that no migration through the entire packaging material takes place. Due to the multitude of packaging materials and their different barrier properties we are not able to provide a general statement regarding through-migration.

Please note that migration can also occur by set-off when the printed surface is pressed against the food-contact surface of the packaging in the stack or reel.

We formulate our FCM products in such a way that potential migration is as low as possible, both through the substrate and by set-off from the printed surface to the food contact surface in the stack or reel.

The UVAFLEX<sup>®</sup> FCM Y81 Ink Series is formulated in accordance with the Nestlé Standard on Printing Inks for Food Packaging (St-80.001, 07/04/2022) and the Nestlé Guide to Packaging Inks (October 2018 edition).

The UVAFLEX<sup>®</sup> FCM Y81 Ink Series is formulated in accordance with the Swiss ordinance 817.023.21 on materials and articles intended to get into contact with food.

Die UVAFLEX<sup>®</sup> FCM Y81 Ink Series is formulated without free bisphenol A and without bisphenol A based raw materials (BPA-NI).

## DECLARATION OF COMPOSITION AND PRODUCT DECLARATION

As there are no specific regulations concerning printing inks and varnishes Zeller+Gmelin -like other ink suppliers- is obliged to follow regulations in the EU not directly related to printing inks.

### Regulation (EC) No 1935/2004

Article 3 of the Regulation (EC) No 1935/2004 (impact on food) demands, that materials and articles do not transfer their constituents to food in quantities which could endanger human health or bring about an unacceptable change in the composition of the food or bring about a deterioration in the organoleptic characteristics thereof.

We urgently advise you to use for printing on food packaging only printing inks/lacquers which we specifically recommend for this application based on FCM formulations.

A possible impact on the quality of food does not solely depend on the printing ink/lacquer itself but is depending on the complete production chain (ink laydown, UV-power, substrate, etc.). For this reason we are

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not able to confirm a general compliance to Regulation (EC) No 1935/2004 only based on the composition of the ink/lacquer.

Based on Article 17 (traceability) material and articles shall be ensured at all stages in order to facilitate control, the recall of defective products, consumer information and the attribution of responsibility.

All raw materials for ink/lacquer batches at Zeller+Gmelin are documented in writing on the Formula Component Report. Based on the batch number every raw material can be clearly traced back to the raw material batch.

### Regulation (EC) No 2023/2006

This so called GMP regulation (Good Manufacturing Practice) defines the requirements on the different participants in the manufacturing process of materials and articles intended to come into contact with food. It requests a system for quality assurance, control and documentation (§5-7). The EuPIA defined the requirements on printing ink manufacturers in the EuPIA-GMP.

### Regulation (EU) No 10/2011 and amendments

Regulation (EU) No 10/2011 establishes the specific rules for plastic materials and articles to be applied for their safe use and repeals Commission Directive 2002/72/EC of 6 August 2002 on plastic materials and articles intended to come into contact with foodstuff.

In this regulation, the so called PIM (Plastic Implementation Measure) limits are set for substances, which are allowed to be in direct contact with food and are allowed to migrate into food up to the level listed in Annex I. Substances used in printing inks must not (with few exemptions) get in direct contact with food and are therefore not listed in Annex I.

Paragraph (30) states, that coatings, printing inks and adhesives are not yet covered by a specific EU legislation and therefore not subject to the requirement of a declaration of compliance.

For the migration of non-authorized substances through a functional barrier into food a limit of 0,01 mg/kg (10 ppb) is defined.

Substances that are mutagenic, carcinogenic or toxic to reproduction should not be used without previous authorisation in food contact materials or articles and should therefore not be covered by the functional barrier concept.

### CEPE / EuPIA – Exclusion Policy

CEPE is the European Council of producers and importers of paints, printing inks and artists colours whereas EuPIA is the European Printing Ink Group of CEPE. Many years ago the printing ink industry has implemented voluntarily the Exclusion Policy for specific substances.

Zeller+Gmelin is an active member in EuPIA and subgroups. The raw materials used by Zeller+Gmelin for the formulation of our printing inks/lacquers meet the guidelines of the CEPE / EuPIA Exclusion Policy. Thus

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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 fulfillment 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.



## TECHNICAL DATA SHEET

# UVAFLEX<sup>®</sup> FCM Y81 Ink Series

## FCM Ink Series for UV Flexo Printing

CMR 1A and 1B raw materials (cancerogenic, mutagenic and reprotoxic) are not used in our printing inks /lacquers.

### Heavy Metals

We herewith confirm that the limits of the heavy metals lead, cadmium, mercury and chromium(VI) layed down by the European packaging and packaging waste directive 94/62/EC as well as the „Model Toxics in Packaging Legislation“ of TPCB (former CONEG) are met. The limits layed down in EN 71-3 („ safety requirements for toys“) are also met. Heavy metals are not part of our formulations.

### Hazardous substances

Substances mentioned in the Directive 2002/95/EC (RoHS) and Directive 2011/65/EC are not intentionally used in our printing inks/lacquers.

SVHC-substances (substances of very high concern): In our products no substances are used which are classified as CMR 1A & 1B, PBT (PBT pollutants are chemicals that are toxic, persist in the environment and bioaccumulate in food chains), vPvB (Substances that are potentially very persistent and very bioaccumulative) und endocrine disruptors (artificial hormones).

Furthermore we confirm that our printing inks/lacquers are in accordance with the Regulation (EC) No 1895 /2005 (repeals the Directive 2002/16/EC).

### DIN EN ISO certification

The production site of Zeller+Gmelin / Germany is certified according to DIN EN ISO 9001:2015 and DIN EN ISO 14001:2015.

### Swiss Ordinance 817.023.21

This ordinance regulates materials and articles intended to come into contact with food. On 01.04.2008 the ordinance was changed to include regulations concerning printing inks. Since 01.04.2010 only packaging which has been produced with printing inks based on listed raw materials may be supplied to consumers. We urgently recommend to only use our FCM products for food packaging being subject to SO817.023.21.

### Please note:

According to applicable law the manufacturer of the finished article and the filler have the full legal responsibility to ensure that their product is fit for its intended purpose and complies with the applicable rules (not the supplier).

Please also consider the relevant publications of the European Printing Inks Association EuPIA (<http://www.eupia.org>).

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There are many types of final packaging and the printing ink/lacquer is only one constituent. Since the parameters in the printing, packing and storage processes are not under the control of the printing ink manufacturer, the printing ink suppliers are not able to issue certificates or declarations of compliance which cover the legal responsibility of the entire packaging chain.

The statements made in this declaration are according to our current knowledge. They do not absolve the user from its own responsibility to ascertain that our products are suitable for his application.

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