



## TECHNICAL DATA SHEET

# UVALUX<sup>®</sup> U3 Ink Series

## Premium Ink Series for UV Offset Printing on Metals

### CHARACTERISTICS

With the UVALUX<sup>®</sup> U3 Ink Series we present a series for UV sheetfed printing on coated metals. The ink series is characterised by its high flexibility.

### TECHNICAL DATA

Drying/Curing	UV-Hg (Mercury Vapour)
Substrate	Metal Coated
Printing Process	Offset Sheet-Fed
Formulation	BPA-NI
Surface Properties	Flexible Ink Film - Glossy - Light Resistance At Least 6
Further Processing	Overvarnishing - Forming - Deep Drawing - Beading - Sterilising (131°C/30min, 121°C/60min)
Application	2 Piece Cans - 3 Piece Cans - Screw Caps - Crown Corks - Long Caps
Market	Metal Decoration
Conformities	Nestlé, Standard on Printing Inks for Food Packaging (St-80,001) - Switzerland, 817.023.21

UVALUX U3 Farbserie

09/2022-UVALUX U3 Farbserie-33

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Available Systems	4 Colour Process - PANTONE <sup>®</sup> Base Colours - Z Base Colours
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Mixing Lists Basis	PANTONE <sup>®</sup> Base Colours - Z Base Colours
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### PACKING UNITS

+ 2,5 kg metal can

### 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

UVALUX<sup>®</sup> U3 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). Additionally they are low-yellowing.

**UVALUX<sup>®</sup> U3-X55001**  
opaque white, undyed for mixing

**UVALUX<sup>®</sup> U3-X55002**  
Opaque white, violet dyed

**UVALUX<sup>®</sup> U3-X55003**  
Opaque white, blue dyed

### ADDITIVES

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### UVALUX<sup>®</sup> U0015 UV Reducer

Addition max. 5%

Reduces the viscosity and the tack.

### UVALUX<sup>®</sup> U0060 UV Accelerator

Addition max. 5%

Improves curing of the ink, viscosity changes only marginally.

### UVALUX<sup>®</sup> U0088 UV Printing Paste

Addition max. 10%

Reduces the tack without reducing the viscosity significantly.

### UVALUX<sup>®</sup> U3-Z2600 Transparent White

Addition unlimited

Highly transparent, for reducing colour strength, tack and viscosity remain at a comparable level.

### UVALUX<sup>®</sup> U0030 UV Matt Paste

Addition max. 20%

Mix with transparent white to obtain a duct matt lacquer. High quantities of matt paste reduce scratch resistance and reactivity of the system. Subsequent thermal treatment of the print can improve scratch resistance. The stability of mixtures of the paste with radiation-curing inks is very limited. Early polymerisation may occur. Therefore please mix only the required quantity immediately before beginning to print.

### 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.

### UV Roller Cleaning Paste UV866

Only for rubbing into ink rollers, not suitable as ink additive

For cleaning of the ink rollers in offset and letterpress printing units from UV inks. Distribute paste with spatula on the oscillating rollers, let machine run without printing for several minutes, scrape off and wash again.

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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.

### SERVICE

Complete PANTONE<sup>®</sup> mixing recommendations. Ink formulation systems, mixing systems and dispensing systems are possible in different expansion levels.

#### Base ink basis for mixing recommendations:

- UVALUX<sup>®</sup> U3-P... PANTONE<sup>®</sup> base inks
- UVALUX<sup>®</sup> U3-Z... high intensity monopigmented base inks

### 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).

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### Fountain Solution

Approved fountain solution parameters:

a) ph-value: 4,8 - 5,2

b) Water hardness: 9 - 12° dH

We recommend the use of temperature controlled ink ducts and fountain solution.

### 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.

### Temperature Resistance

All inks of this series are suitable for heat sterilising at 131°C/30min or 121°C/60min. In addition the individual colours have the following temperature resistance:

U3-Z2100 Yellow: 180°C/10 min.

U3-Z2101 Yellow: 200°C/10 min.

U3-Z2102 Yellow: 200°C/10 min.

U3-Z2150 Orange: 200°C/10 min.

U3-Z2201 Red: 200°C/10 min.

U3-Z2202 Red: 200°C/10 min.

U3-Z2204 Red: 200°C/10 min.

U3-Z2205 Red: 200°C/10 min.

U3-Z2251 Violet: 200°C/10 min.

U3-Z2301 Blue: 200°C/10 min.

U3-Z2302 Blue: 200°C/10 min.

U3-Z2350 Green: 200°C/10 min.

U3-Z2400 Black: 200°C/10 min.

U3-Z2500 Opaque White: 180°C/10 min.

U3-Z2600 Transparent White: 180°C/10 min.

### 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

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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. Especially when the base- or topcoats are changed we recommend pretests.

## 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

### Process Inks CMYK:

U3-S1x00 Standard Process Inks. Better adhesion properties in comparison to our low-odour process set

U3-S1x05 Low-Odour Process Inks. Viskosity slightly higher than standard set for better performance at warm temperatures

### Zeller+Gmelin Base Inks:

U3-Z... high intensity monopigmented base inks

### PANTONE<sup>®</sup>:

U3-P... PANTONE<sup>®</sup> base inks

U3-C... PANTONE<sup>®</sup> mixed shades "coated"

**Special Colours:** U3-X...

**Covering White:** U3-X55...

## MONOPIGMENTED BASE INKS

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For ink mixing we recommend our mono-pigmented base inks. It is a print-ready system, with maximum colour strength. These base inks contain only one pigment respectively.

### Advantages:

- Ink formulations are better reproducible
- Higher production security
- The higher colour-intensity makes printing with reduced ink lay-down possible
- Reduced dot gain
- More flexibility when adjusting colour strength for solids or fine texts
- Mixing recommendations are available for all PANTONE<sup>®</sup> mixed shades
- Ink dispensing, mixing and measuring systems with different expansion levels available

### Product designation of the monopigmented base inks:

- UVALUX<sup>®</sup> U3-Z... high intensity monopigmented base inks

## RESISTANCE PROPERTIES

Colour Name	Article Number	Light Resistance	Spirit Resistance	Solvent Resistance	Alkali Resistance
<b>4 Colour Process</b>					
Yellow (Red Shade)	U3-S1100	7 BWS	+	+	-
Yellow (Green Shade)	U3-S1101	6 - 7 BWS	+	+	-
Magenta	U3-S1200	6 - 7 BWS	+	+	+
Cyan	U3-S1300	8 BWS	+	+	+
Black	U3-S1400	8 BWS	+	+	+
Black (Dense Black)	U3-S2400	8 BWS	+	+	+
Yellow (low-odour)	U3-S1105	7 BWS	+	+	-
Magenta (low-odour)	U3-S1205	6 - 7 BWS	+	+	+
Cyan (low-odour)	U3-S1305	8 BWS	+	+	+
Black (low-odour)	U3-S1405	8 BWS	+	+	+
<b>PANTONE<sup>®</sup> Base Colours</b>					
Yellow	U3-P100	7 BWS	+	+	-

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Yellow 012	U3-P101	7 BWS	+	+	-
Orange 021	U3-P150	6 BWS	+	+	+
Warm Red	U3-P200	6 BWS	+	+	+
Red 032	U3-P201	6 BWS	+	+	+
Rubine Red	U3-P202	6 - 7 BWS	+	+	+
Rhodamine Red	U3-P203	6 - 7 BWS	+	+	+
Purple	U3-P250	6 - 7 BWS	+	+	+
Violet	U3-P251	6 - 7 BWS	+	+	+
Reflex Blue	U3-P300	6 - 7 BWS	+	+	+
Process Blue	U3-P301	8 BWS	+	+	+
Blue 072	U3-P302	6 - 7 BWS	+	+	+
Green	U3-P350	8 BWS	+	+	+
Black	U3-P400	8 BWS	+	+	+
<b>Z Base Colours</b>					
Yellow	U3-Z2100	7 BWS	+	+	+
Yellow	U3-Z2101	7 BWS	+	+	-
Yellow	U3-Z2102	7 BWS	+	+	-
Orange	U3-Z2150	6 BWS	+	+	+
Red	U3-Z2201	7 BWS	+	+	+
Red	U3-Z2202	6 BWS	+	+	+
Red	U3-Z2204	6 - 7 BWS	+	+	+
Red	U3-Z2205	6 - 7 BWS	+	+	+
Violet	U3-Z2251	6 - 7 BWS	+	+	+
Blue	U3-Z2301	8 BWS	+	+	+
Blue	U3-Z2302	8 BWS	+	+	+
Green	U3-Z2350	8 BWS	+	+	+
Black	U3-Z2400	8 BWS	+	+	+
Opaque White	U3-Z2500	8 BWS	+	+	+
Transp.White	U3-Z2600				

### REMARKS ON MIGRATION AND CONFORMITY

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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 UVALUX<sup>®</sup> U3 Ink Series has no special FCM formulation. However various analyses of metal packaging have shown that it is possible with this ink series to achieve conformity with EU packaging legislation.

The Nestlé guidance note dated October 2018 contains an exclusion list for photo-initiators which explicitly does not apply to UV printing on metal substrates (cans, closures) which undergo a subsequent thermal curing process (e.g. oven cured).

The UVALUX<sup>®</sup> U3 Ink Series is formulated without free bisphenol A and without bisphenol A based raw materials (BPA-NI).

The UVALUX<sup>®</sup> U3 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).

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The UVALUX<sup>®</sup> U3 Ink Series is formulated in accordance with the Swiss ordinance 817.023.21 on materials and articles intended to get into contact with food.

### 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 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

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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 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 TPCH (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).

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### 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>).

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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