



## TECHNICAL DATA SHEET

# UVALUX<sup>®</sup> LED U540 Ink Series

Ink series for LED UV Offset Commercial and Packaging printing

### CHARACTERISTICS

The UVALUX<sup>®</sup> LED U540 Ink Series represents a new generation of our inks for LED-UV offset printing on paper.

They have been designed specifically for processing with energy saving LED-UV units from all market-common suppliers with the wavelengths 385 or 395nm. They can also be cured with traditional mercuryvapor-UV or LE-UV/H-UV lamps.

UVALUX<sup>®</sup> LED U540 is at home on your printing press. Homogenous press performance, wide water range (very good ink-water-balance), very good flow behaviour and an excellent printability characterize this LED ink series. The UVALUX<sup>®</sup> LED U540 Ink Series has a very high reactivity and rub resistance. This makes it ideal for perfecting and reprinting.

### TECHNICAL DATA

Drying/Curing	UV-LED (385 / 395nm) - H-UV - UV-Hg (Mercury Vapour)
Substrate	Paper Uncoated - Paper Coated - Carton board
Printing Process	Offset Sheet-Fed - Offset Web-Fed
Press Performance	High Reactivity - Good Ink-Water-Balance - Good Flow Properties on the Press
Further Processing	Hotfoiling - Coldfoil - Laminating (Glue) - Thermal Transfer - Overvarnishing
Application	Brochures - Direct Mail - Forms - Job Printing - Envelopes - Folded Box
End Application	Non-Food

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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Market	Commercials - Packaging
Available Systems	PSO Process Colours - Z Base Colours
Mixing Lists Basis	Z Base Colours

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### PACKING UNITS

- + 2,5 kg plastic can (black)
- + 2 kg plastic ballhead cartridge (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

UVALUX<sup>®</sup> LED U540 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).

#### UVALUX<sup>®</sup> LED U540-ZWO01SR

Standard opaque white, undyed:

High opacity and very low yellowing. Suitable for preprinting on coloured substrates.

### ADDITIVES

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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### UVALUX<sup>®</sup> U06581FCM UV-LED Accelerator

Addition max. 10%

Improves curing of the ink, viscosity and colour strength are slightly changed.

### UVALUX<sup>®</sup> U0021 UV Slip Additive

Addition max. 2%

Improves scratch- and tape resistance. Please note that after adding the slip agent U0021 further processing such as lacquering, thermaltransfer printing or hotfoil stamping is not possible any more. Please make sure to stir in the slip agent very thoroughly.

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

Addition max. 10%

Reduces the tack without reducing the viscosity significantly.

### 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.

### 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.

### 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:

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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Ink series for LED UV Offset Commercial and Packaging printing

- 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 6 months from the date of delivery.

## 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).

### 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. Please note that the light fastness test is very time-consuming and is still in progress. The indicated light fastnesses are therefore to be regarded as preliminary. Tested and confirmed light fastness values will be available from the following date: Approx. September 2023

### Resistance requirements when using dispersion varnishes

Inks overprinted with dispersion varnishes should be resistant against alkali according to DIN 16524.

Exception: Although the standard Magenta pigment of our UVALUX<sup>®</sup> LED U540 Ink Series is not alkali resistant it can be overprinted with common dispersion lacquers without problems.

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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## TECHNICAL DATA SHEET

# UVALUX<sup>®</sup> LED U540 Ink Series

Ink series for LED UV Offset Commercial and Packaging printing

### 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

#### Process Inks CMYK:

U540-S4... PSO process inks according to DIN ISO 2846-1

#### Zeller+Gmelin Base Inks:

U540-Z... high intensity monopigmented base inks

#### PANTONE<sup>®</sup>:

U540-P... PANTONE<sup>®</sup> base inks

### MONOPIGMENTED BASE INKS

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

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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## TECHNICAL DATA SHEET

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Ink series for LED UV Offset Commercial and Packaging printing

- More flexibility when adjusting colour strength for solids or fine texts
- Mixing recommendations are available for all PANTONE® mixed shades
- Ink dispensing, mixing and measuring systems with different expansion levels available

### Product designation of the monopigmented base inks:

- UVALUX® LED U540-Z... high intensity monopigmented base inks

### RESISTANCE PROPERTIES

Colour Name	Article Number	Light Resistance	Spirit Resistance	Solvent Resistance	Alkali Resistance
<b>PSO Process Colours</b>					
Yellow	U540-S4110	5 BWS	+	+	+
Magenta	U540-S4210	5 BWS	+	+	-
Cyan	U540-S4310	8 BWS	+	+	+
Black	U540-S4410	8 BWS	+	+	-
<b>PANTONE® Base Colours</b>					
Yellow	U540-P100	5 BWS	+	+	+
Yellow 012	U540-P101R	4 BWS	+	+	+
Orange 021	U540-P150	3 BWS	+	+	+
Warm Red	U540-P200	3 BWS	+	+	-
Red 032	U540-P201	3 BWS	+	+	-
Rubine Red	U540-P202	5 BWS	+	+	-
Rhodamine Red	U540-P203SR	6 - 7 BWS	+	+	+
Bright Red	U540-P204	3 BWS	+	+	-
Pink	U540-P206SR	6 - 7 BWS	+	+	+
Purple	U540-P250	4 BWS	-	-	-
Violet	U540-P251	4 BWS	-	-	-
Medium Purple	U540-P252	4 BWS	-	-	-
Reflex Blue	U540-P300	4 BWS	-	-	-
Process Blue	U540-P301SR	8 BWS	+	+	+

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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# UVALUX® LED U540 Ink Series

Ink series for LED UV Offset Commercial and Packaging printing

Blue 072	U540-P302	4 BWS	-	-	-
Green	U540-P350SR	8 BWS	+	+	+
Black	U540-P400SR	8 BWS	+	+	+
<b>Z Base Colours</b>					
Base Yellow	U540-ZYN01R	4 BWS	+	+	+
Base Yellow Red Shade	U540-ZYR01S	7 BWS	+	+	-
Base Yellow Green Shade	U540-ZYG01SR	6 - 7 BWS	+	+	+
Base Orange	U540-ZON01R	5 BWS	+	+	+
Base Red Yellow Shade	U540-ZRY01	3 BWS	+	+	-
Base Red Yellow Shade	U540-ZRY02SR	6 - 7 BWS	+	+	+
Base Red Blue Shade	U540-ZRB01	5 BWS	+	+	-
Base Red Blue Shade	U540-ZRB02SR	6 - 7 BWS	+	+	+
Base Red Pink Shade	U540-ZRP01	4 BWS	-	-	-
Base Red Pink Shade	U540-ZRP02SR	6 - 7 BWS	+	+	+
Base Violet	U540-ZVN01	4 BWS	-	-	-
Base Violet	U540-ZVN02SR	6 - 7 BWS	+	+	+
Base Blue Red Shade	U540-ZBR01	4 BWS	-	-	-
Base Blue Green Shade	U540-ZBG01SR	8 BWS	+	+	+
Base Green	U540-ZGN01SR	8 BWS	+	+	+
Base Black	U540-ZKN01SR	8 BWS	+	+	+
Base White Opaque	U540-ZWO01SR	8 BWS	+	+	+
Base White Transparent	U540-ZWT02		+	+	+

### 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.

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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# UVALUX<sup>®</sup> LED U540 Ink Series

## Ink series for LED UV Offset Commercial and Packaging printing

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> LED U540 Ink Series has no special FCM formulation. Therefore we recommend for food packaging FCM ink series and lacquers which are available for many applications.

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.

## 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

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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# UVALUX<sup>®</sup> LED U540 Ink Series

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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 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

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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## TECHNICAL DATA SHEET

# UVALUX<sup>®</sup> LED U540 Ink Series

Ink series for LED UV Offset Commercial and Packaging printing

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 TPC (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).

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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TECHNICAL DATA SHEET

## UVALUX<sup>®</sup> LED U540 Ink Series

Ink series for LED UV Offset Commercial and Packaging printing

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.

UVALUX LED U540 Farbserie

05/2024-UVALUX LED U540 Farbserie-12

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11 / 11