

# INFORMATION

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By printing ink and lacquer

## UVAROLID® UV/UK Series

### UV Curing Dry Offset Printing Inks

#### Characteristics

**UVAROLID®** inks are UV-curing printing inks specially developed for direct printing on plastic cups, lids, buckets, capsules, tubes and tops.

**UVAROLID®** inks are printed with special printing machines in dry offset (reverse letterpress) on pre-formed plastic containers.

#### Printing Process:

UV dry offset (reverse letterpress)

#### Products:

##### UVAROLID® UV

UV curing ink series for printing on plastic cups, lids, buckets and closures.

##### UVAROLID® UK

UV curing ink series which can be over-varnished for printing on plastic tubes, and capsules.

#### Technical Data

#### Properties:

- high reactivity
- high gloss
- excellent adhesion
- very good surface hardness
- high colour intensity
- excellent resistances against different fillings
- ITX-free
- non low-migration (see page 4)

#### Substrates

#### Plastics:

All non absorbent substrates common in the market, like PE, PP, PS, ABS, PET, PVC.

The series is suitable for injected, extruded and blow-moulded preformed containers.

#### Important:

Before beginning to print we recommend practice oriented pretests, in order to test the desired characteristics of the finished product. On request we are also able to make test prints for you on your specific substrate.

#### Packaging

Standard packaging: 1 kg can

#### Service

Complete PANTONE® mixing recommendations on the basis of our high pigmented **UVAROLID® UV-Z2.../UK-Z2...** base-inks

Ink dispensing, mixing and measuring systems with different expansion levels.

#### Technical Service Centre

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](mailto:Ink-Service@Zeller-Gmelin.de)

Tel: +49 7161 802-279

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### Opaque Whites

The **UVAROLID®** 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).

#### **UVAROLID® UV Opaque White**

- **UV-X55015** - Standard opaque white
- **UV-X55020** – Mixing opaque white  
Addition max. 75%  
White with maximum pigmentation.  
Only for mixing, not printable pure.

#### **UVAROLID® UK Opaque Whites**

- **UK-X55015** - Standard opaque white
- **UK-X55020** – Mixing opaque white  
Addition max. 75%  
White with maximum pigmentation.  
Only for mixing, not printable pure.
- **UK-X55030** – Low-yellowing opaque white

### Additives

#### **UVALUX® UV Reducer U0010**

Addition 2-5%  
Reduces the viscosity.

#### **UVALUX® UV Slip Additive U0020**

Addition 1-2%  
Improves scratch and tape resistance. Reduces blocking. High concentrated paste.  
Not suitable for UK inks!

#### **UVALUX® UV Slip Sdditive U0021**

Addition 2-5%  
Improves scratch and tape resistance. Reduces blocking. Lower concentrated than U0020 but liquid and therefore easier to mix in.  
Not suitable for UK inks!

#### **UVALUX® UV Printing Paste U0088**

Addition 3-10%  
Reduces the tack without reducing the viscosity significantly.

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#### **UVAROLID® Rub Protection Paste U0947**

Addition 1-3%  
Reduces ink marking on the inside of cups.  
Overprintable.

#### **UVAROLID® UV Varnish UV/UK-X60005,**

Addition 10-30%  
Improves ink transfer and print sharpness.

#### **UVAROLID® Transparent White UV/UK-X60001**

For reducing colour strength. No impact on viscosity.

#### **Remark:**

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

### Printing material

All printing materials have to be resistant against ester and ketones. Therefore “rubber” rollers are mostly made of EPDM.

### Storage

#### **Optimal storage conditions:**

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

#### **Remarks:**

- protect from frost
- store in a cool and dark place
- ink should be closed immediately after usage

#### **Warranty:**

If the inks are stored correctly, we guarantee a shelf life of 6 months from date of delivery, as our raw material suppliers guarantee this period to us. However we know from practical experience that the inks can remain usable for 1-2 years or longer if they are properly handled and stored.

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### 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

#### Base Inks:

UV/UK-Z2...	monopigmented base inks
UV/UK-Z2...S	high light resistant monopigmented base inks

#### PANTONE®

UV/UK-P...	PANTONE® base inks
UV/UK-P...S	high light resistant version PANTONE® base inks

#### PANTONE®

UV/UK-C...	PANTONE® mixed shades "Coated"
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**Special Colours:** UV/UK-X...

**Opaque White:** UV/UK-X55...

**Transparent White:** UV/UK-X60001

### Monopigmented Base Inks

For ink mixing we recommend our mono-pigmented **UVAROLID® UV/UK-Z2...** base inks. It is a print-ready system, with maximum colour strength.

The **UVAROLID® UV/UK-Z2...** base inks contain only one pigment respectively. Each pigment in a mixed ink has an influence on the resulting colour shade. The fewer pigments are included in a mixed shade the easier it is to match and adjust the colour shade of the reference sample.

Because of the better colour control when mixing with monopigmented ink **formulations are better reproducible and thus the production security is higher.**

Additionally there are less colour deviations between reference sample and mixed ink under changing light sources (metamerism).

#### Further Advantages:

- 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® mixed shades.
- Ink dispensing, mixing and measuring systems with different expansion levels available.

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### Remarks on Migration and Conformity

The following remarks are valid for the production of food packaging which conforms to the regulations in the European Union. We can not make any statements concerning food packaging legislation of countries outside the EU.

Regulation (EC) No. 1935/2004 requires that the one responsible for the “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 have an influence on the food-legislation related properties of a packaging. The production process of the packaging has a significant impact as well.

Therefore we recommend that you send your finished products to a recognized analytical institute for examination and certification. That way you can prove that your products comply with the legal requirements.

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

- correct processing, especially the complete through-cure of the ink film
- type of substrate and substrate thickness (sufficient barrier effect of the substrate)
- prevention of a direct contact of the printing ink with the food
- use of low-migration printing inks

The **UVAROLID® UV and UK** ink series have no low-migration formulation.

This is the reason why we recommend our special **low-migration UVACURID® C71** ink series for the production of food packaging.

Analytical results show that it is possible to stay well within the 10 ppb migration limit\* with our **UVACURID® C71** series provided that they are properly used (\*guide line 2007/19/EC).

Generally you should ensure with a migration analysis that no migration through the entire packaging system takes place. Due to the multitude of packaging materials and their completely different barrier properties we are unable to make any statements regarding through-migration.

However 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.




























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## Resistance Properties for UVAROLID® PANTONE® Base Inks

Colour Shade	Item Number	Light Resistance	Spirit	Solvent Mixture	Alkali	Colour Shade
Yellow	UV/UK-P100	5	+	+	+	
Yellow 012	UV/UK-P101	5	+	+	+	
Orange 021	UV/UK-P150	5-6	+	+	+	
Warm Red	UV/UK-P200	4	+	+	+	
Red 032	UV/UK-P201	4	+	+	+	
Rubine Red	UV/UK-P202	5-6	+	+	+	
Rhodamine Red	UV/UK-P203	5	+	+	+	
Purple	UV/UK-P250	6-7	+	+	+	
Violet	UV/UK-P251	6-7	+	+	+	
Reflex Blue	UV/UK-P300	5	+	+	+	
Process Blue	UV/UK-P301	8	+	+	+	
Blue 072	UV/UK-P302	6-7	+	+	+	
Green	UV/UK-P350	8	+	+	+	
Black	UV/UK-Z2400	8	+	+	+	
<b>High Light Resistant Version</b>						
Yellow	UV/UK-P100S	7	+	+	+	
Yellow 012	UV/UK-P101S	7	+	+	+	
Orange 021	UV/UK-P150S	7	+	+	+	
Warm Red	UV/UK-P200S	6-7	+	+	+	
Red 032	UV/UK-P201S	6-7	+	+	+	
Rubine Red	UV/UK-P202S	6-7	+	+	+	
Rhodamine Red	UV/UK-P203S	6-7	+	+	+	
Purple	UV/UK-P250S	6-7	+	+	+	
Violet	UV/UK-P251S	6-7	+	+	+	
Reflex Blue	UV/UK-P300S	6-7	+	+	+	
Process Blue	UV/UK-P301S	8	+	+	+	
Blue 072	UV/UK-P302S	6-7	+	+	+	
Green	UV/UK-P350S	8	+	+	+	

**The colours shown are only for illustration. The colours are not a binding colour sample!**

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## Resistance Properties UVAROLID® Z2-Base Inks

Colour Shade	Item Number	Light Resistance	Spirit	Solvent-Mixture	Alkali	Colour Shade
Yellow	UV/UK-Z2100	6-7	+	+	+	
Yellow	UV/UK-Z2101	5	+	+	+	
Orange	UV/UK-Z2150	5-6	+	+	+	
Red	UV/UK-Z2200	4	+	+	+	
Red	UV/UK-Z2201	5-6	+	+	+	
Red	UV/UK-Z2202	5-6	+	+	+	
Red	UV/UK-Z2203	6-7	+	+	+	
Violett	UV/UK-Z2250	6-7	+	+	+	
Blue	UV/UK-Z2300	8	+	+	+	
Green	UV/UK-Z2350	8	+	+	+	
Black	UV/UK-Z2400	8	+	+	+	
<b>High Light Resistant Version</b>						
Yellow	UV/UK-Z2100S	6-7	+	+	+	
Yellow	UV/UK-Z2101S	7	+	+	+	
Orange	UV/UK-Z2150S	7	+	+	+	
Red	UV/UK-Z2200S	6	+	+	+	
Red	UV/UK-Z2201S	6	+	+	+	
Red	UV/UK-Z2202S	6-7	+	+	+	
Red	UV/UK-Z2203S	6-7	+	+	+	
Violett	UV/UK-Z2250S	6-7	+	+	+	
Blue	UV/UK-Z2300S	8	+	+	+	
Green	UV/UK-Z2350S	8	+	+	+	
Black	UV/UK-Z2400S	8	+	+	+	

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## 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 1935/2004

Article 3 of the Regulation 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 which we specifically recommend for this application and which have a low-migration formulation (see page 1 and 4 of this document).

A possible impact on the quality of food does not solely depend on the printing ink itself but is depending on the complete production chain (ink laydown, UV-power, substrate, etc.). For this reason we can generally not confirm a compliance to Regulation 1935/2004 only based on the composition of the ink.

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 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.

### Directive 2002/72/EC

this so-called "plastics directive" lists substances which are allowed to get into direct contact with foodstuffs. It also sets migration limits for each substance up to which the substances are allowed to migrate into the food (listed in the annex of the directive and its amendments). Printing ink components are not allowed to get into direct contact with foodstuffs and are therefore not included in this list. This is the reason why we can not confirm the conformity of our products with directive 2002/72/EC.

### Directive 2007/19/EC

This Directive, which is an amendment to the Plastics Directive 2002/72/EC, provides limits for substances not listed in the corresponding annexes of the Plastics Directive and amendments. Most components used in printing inks are not intended to get into direct contact with foodstuff. Therefore directive 2007/19/EC does not indicate specific migration limits for them. For these substances without SML a general limit of <10ppb (10 µg/kg food) for the transfer into food has to be undercut (Article 7). Again, many different factors have an impact on the migration (see remark under 1935/2004). Therefore a compliance to Directive 2007/19/EC can not be confirmed.

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## CEPE / EuPIA – Exclusion List

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. The printing ink industry voluntarily came up with the Exclusion List for specific substances many years ago.

Zeller+Gmelin is an active member in the EuPIA and subgroups. The raw materials used by Zeller+Gmelin for the formulation of our printing inks meet the guidelines of the CEPE / EuPIA Exclusion list. This means that CMR-substances (cancerogenic, mutagenic and reprotoxic) plus T (toxic) and T<sup>+</sup> (very toxic) are not used in our printing inks.

## Heavy Metals

CONEG stands for Coalition of North-Eastern Governors in the USA . One of their legislations, adopted by 18 states as of 1998, requires reductions in the amount of the four heavy metals mercury, lead, cadmium, and hexavalent chromium in packaging and packaging components sold or distributed in their member states. For Zeller+Gmelin printing inks the limits for heavy metals as listed in the CONEG-Regulation (USA) are met. The Euro Norm 71.3 refers to the max level of heavy metals in childrens toys. For Zeller+Gmelin printing inks the limits for heavy metals as listed in the DIN EN 71-3 are met. Heavy metals are no part of our formulations.

## Hazardous substances

Substances mentioned in the directive **2002/95/EC** (RoHS) are not intentionally used in our formulations / printing inks.

**SVHC-substances** (substances of very high concern): In our products no substances are used which meet the criteria of SVHC-substances (substances of very high concern). SVHC-substances are substances which are classified as CMR 1 & 2, 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).

The substances listed in the guide line **67/548/EEC** (amended by the directive **2006/121/EC**) and in the guide line **76/769/EEC** are not part of the formulation of our printing inks.

Furthermore we confirm that our printing inks are in accordance with the EC regulation **1895/2005** (repeals the guide line **2002/16/EC**).

## ISO 9001

The production site of Zeller+Gmelin / Germany is certified according to DIN EN ISO 9001:2000 and DIN EN ISO 14001:2005 (corresponds to EN ISO 14001 edition Nov. 2004).

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**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 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 (Text from EuPIA-PIFOOD May 2007).

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Zeller+Gmelin GmbH & Co. KG



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