

**UV-curable screen printing ink for all Optical Disc Formats**

**Optimized rheology, high-gloss surface, excellent print sharpness, good opacity, press-ready**

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## Field of Application

### Substrates

Ultradisc UVOD is a UV-curable screen printing ink suitable for printing onto all optical disc formats (directly onto Polycarbonate PC or spin-coated surfaces) such as

- CD
- CD-ROM
- CD-R/RW
- DVD
- Blu-ray

Since the different spin coatings are subject to a certain post-curing, overprinting with Ultradisc UVOD should generally be carried out as soon as possible. Preliminary trials as to the compatibility of the spin coat and the printing ink are essential.

Since all the print substrates mentioned may be different in printability even within an individual type, preliminary trials are essential to determine the suitability for the intended use.

## Characteristics

Ultradisc UVOD colour shades are very brilliant at a best possible opacity and high gloss. The optimized thixotropic adjustment of the ink (rheology) guarantees an easy handling at the printing machine and prevents the ink from flowing back into the printing motif.

### Ink Adjustment

Ultradisc UVOD is press-ready. The ink should be stirred homogeneously before printing and if necessary during production.

### Drying

Ultradisc UVOD is a fast curable UV ink. A UV drying unit with one medium pressure Mercu-

ry Vapour Lamp (capacity 150 - 200 W/cm) will cure UVOD.

The curing speed of the ink is generally dependent upon the kind of UV-curing unit (reflectors), number, age, and power of the UV-lamps, the printed ink film thickness, colour shade, substrate in use, as well as the printing speed.

### Stress resistance

UVOD basic shades have been tested as follows:

#### 1. Adhesion:

Tape no. 4104/25 mm by Beiersdorf should be applied under thumb pressure and removed in one go. This test should be repeated at two different spots. If no ink is removed, the requirements for ink adhesion are met.

-> result: positive

#### 2. Hardness:

Test with an Erichsen pencil hardness device, pencil hardness as per Wolff Wilborn

-> result: 3H

#### 3. Alcohol resistance:

100 double rub strokes (500 g) with a paper soaked with ethanol (99.8 %)

-> result: no changes

#### 4. Rub resistance:

With a test device made by Prüfbau with 500 g weight and different rub fleeces

-> result: no rubbing through

#### 5. Sweat and saliva resistance:

As per DIN 53 160, reaction time of the test solvents: 2 h.

-> result: no changes

#### 6. Solvent resistance:

As per DIN 16 524, reaction time of the solvent mix for 5 min and 50 double rub strokes

# Ultradisc UVOD



(500 g) with paper soaked with the solvent mix (Test solvent: 30 vol. % ethylacetate, 10 vol.% ethyl glycol, 10 vol. % acetone, 30 vol. % ethyl alcohol + 20 vol. % toluene)  
-> result: no changes

## 7. Environmental chamber test:

Carried out with an environmental test chamber from Heraeus Vötsch, HC 4020 type (70°C and 50 % relative humidity for 96 hours)  
-> result: passed

## Range

### Basic Shades

922	Light Yellow
924	Medium Yellow
926	Orange
932	Scarlet Red
934	Carmine Red
936	Magenta
950	Violet
952	Ultramarine Blue
956	Brilliant Blue
960	Blue Green
962	Grass Green
970	White
980	Black

### 4-Colour Process Shades Standard

425	Process Yellow
435	Process Magenta
455	Process Cyan
485	Process Black

### 4-Colour Process Shades Special

428	Process Yellow
438	Process Magenta
458	Process Cyan
488	Process Black

### High Opaque Shades

170	Opaque White
171	Opaque White
172	Opaque White
173	Opaque White
179	Opaque White
180	Opaque Black

### Fluorescent Shades

320	Fluorescent Yellow
323	Fluorescent Orange
331	Fluorescent Red
333	Fluorescent Pink
364	Fluorescent Green

### Further Products

091	UVOD-ML
270	High Gloss White
409	Transparent Base
904	Special Binder
912	Overprint Varnish
914	Satin Transparent Varnish

Compared to the highly transparent process shades 4x8, the pigmentation of the 4x5 set has been reduced by 20% and is therefore best suited for printing skin tones. Both the highly transparent sets of 4 colour process shades can be over-printed as well as pre-printed.

UVOD 170: Glossy, suited for CD/DVD. Excellent tilt results and very good offset overprintability (up to 135 passes/min).

UVOD 171: High gloss, suited for CD/DVD. Good offset overprintability (up to 135 passes/min).

UVOD 172: Satin gloss, suited for CD/DVD. Very good tilt results and excellent offset overprintability. Smooth surface, squeegee marks and mesh structures are hardly visible (up to 135 passes/min).

UVOD 173: High gloss, suited for CD/DVD. Especially for High Speed machines with up to 135 passes. Highly reactive with best offset overprintability (up to 135 passes/min).

UVOD 179: Glossy, well-priced, excellent printability with a very good homogeneous ink flow, suited for CD/CD-R printing (up to 135 passes/min).

UVOD 180: Deep black with high opacity.

All opaque whites & black have a high opacity and a viscosity adjustment suited for high printing speeds (75-135 sequences/min). They further excel owing to their best possible degree of white / black. In case of overprinting with waterless UV-curable 4-colour process offset shades, please use our Ultraset UVOS ink type.

Mixtures of UVOD fluorescent shades with

Vers. 13  
2014  
31. Jan

# Ultradisc UVOD



Vers. 13  
2014  
31. Jan

UVOD basic shades must be processed within 8 hours.

UVOD-ML: Best suited for overprinting screen and offset prints, and writable with common waterproof marker pens. Furthermore, UVOD-ML can be overprinted with the UVOD basic shades.

UVOD 270: Suited for CD/DVD/Blu-ray Disc. Very good tilt results and excellent offset over-printability. Smooth surface, squeegee marks and mesh structures are hardly visible (up to 150 passes/min).

UVOD 912: High-gloss, transparent overprint varnish for the coating of offset and 4-colour process screen prints.

UVOD 914: Additional screen-printed protection to reduce the surface sensitivity of CD-R's as well as to generally improve the handling of them. The homogeneous surface is excellently suited for overprinting with UVOD basic shades for graphic decoration.

All shades are intermixable. Mixing with other ink types or auxiliaries must be avoided in order to maintain the special characteristics of this ink.

All basic shades are included in our Marabu-ColorFormulator (MCF). They build the basis for the calculation of individual colour matching formulas, as well as for shades of the common colour reference systems HKS®, PANTONE®, and RAL®. All formulas are stored in the Marabu-Color Manager software.

## Metallics

### Metallic Pastes

S-UV 191	Silver	20%
S-UV 192	Rich Pale Gold	25%
S-UV 193	Rich Gold	25%

These metallics are to be added to UVOD 912 in the recommended amount, whereat the addition may be individually adjusted to the respective application. We recommend preparing

a mixture which can be processed within a maximum of 8 h since metallic mixtures usually cannot be stored. Owing to the smaller pigment size of Metallic Pastes it is possible to work with finer fabrics like 140-31 to 150-31.

All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

## Auxiliaries

UVV 1	Thinner	1-10%
UVV 2	Thinner	1-10%
STM	Thickening Agent	0.5-2%
UVVM	Levelling Agent	0.5-1.5%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 78°C)	

The addition of thinner reduces the ink viscosity if necessary. An excessive addition of thinner will cause a reduction of the curing speed, as well as of the printed ink film's surface hardness. The thinner becomes part of the cross-linked matrix when UV-cured and may slightly change the inherent odour of the printed and cured ink film.

The Thickening Agent STM enhances the ink's viscosity without significantly influencing the degree of gloss. Please stir well, the use of an automatic mixing machine is recommended.

The Levelling Agent UV-VM helps to eliminate flow problems which may arise due to residuals on the substrate's surface or incorrect adjustment of the machines. An excessive amount may reduce the ink's adhesion when overprinting. UV-VM must be stirred homogeneously before printing.

The cleaners UR 3 and UR 4 are recommended for manual cleaning of the working equipment.

Cleaner UR 5 is recommended for manual or automatic cleaning of the working equipment.

## Printing Parameters

Generally, fabrics of 140-31 to 180-27 threads can be used. Generally, a plain weave, as well as a high and uniform tension of the fabric are important (> 18 N).

### Recommendations

Standard shades	150-31
4-clr. process shades	165-27/31 bis 180-27
Opaque Whites	150-31
Fluorescents, bronzes	140-31 oder 150-31

For UV inks, all commercially available solvent resistant capillary films (12-18  $\mu$ ) or photo emulsions and combined stencils can be used. Especially when 4-colour process printing, an emulsion layer of 5  $\mu$ m maximum thickness is recommended.

## Mileage

The mileage per kg of ink with a 150-31 fabric is approx. 6,000 to 7,000 CD's if the whole surface is printed, or up to 25,000 CD's with text (coverage e. g. 25%).

## Shelf Life

Shelf life depends very much on the formula/ reactivity of the ink system as well as the storage temperature. It is two years for all UVOD colour shades for an originally closed ink can if stored in a dark room at a temperature of 15-25° C.

Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, the warranty given by Marabu expires.

## Note

Our technical advice whether spoken, written, or through test trials corresponds to our current knowledge to inform about our products and their use. This is not meant as an assurance for certain properties of the products nor their suitability for each application.

You are, therefore, obliged to conduct your own tests with our supplied products to confirm their suitability for the desired process or purpose. The selection and testing of the ink for specific applications is exclusively your responsibility. Should, however, any liability claims arise, they shall be limited to the value of the goods delivered by us and utilised by you with respect to any and all damages not caused intentionally or by gross negligence.

### Labelling

For Ultradisc UVOD and its auxiliaries, there are current Material Safety Data Sheets available according to EC regulation 1907/2006, informing in detail about all relevant safety data including labelling according to the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be derived from the respective label.

### Safety rules for UV printing inks

UV-inks contain some substances which may irritate the skin. Therefore, we recommend to take utmost care when working with UV-curable printing inks. Parts of the skin soiled with ink are to be cleaned immediately with water and soap. Please read the notes on labels and safety data sheets.